

HAZARD RANKING SYSTEM DOCUMENTATION PACKAGE SMITHTOWN GROUND WATER CONTAMINATION SMITHTOWN, SUFFOLK COUNTY, NEW YORK

CERCLIS ID No.: NY0002318889

VOLUME 1 of 2

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Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:

Region II Superfund Technical Assessment and Response Team
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SECTION I: SITE SUMMARY

SITE SUMMARY

The Smithtown Ground Water Contamination site is a contaminated ground water plume located in the Town of Smithtown, Suffolk County, New York (see Figure 1). The area is encompassed by the Villages of Nissequogue and Head of the Harbor, and by the Hamlet of St. James. Homes in this area use private wells for potable water supply and septic systems for sanitary waste water disposal. At this time, the area affected by the contaminated plume is not serviced by a public water supply. The site is situated south of the Stony Brook Harbor and east of the Nissequogue River. To date, the specific source or sources of the contaminated plume have not been identified.

On October 9, 1997, the U.S. Environmental Protection Agency (EPA) received a written request from the New York State Department of Environmental Conservation (NYSDEC) requesting assistance in funding alternative water supplies for residences affected by contaminated ground water. Attached to this request was a private well sampling survey prepared by the Suffolk County Department of Health Services (SCDHS), which presented drinking water survey results for 34 private wells in the area. Analytical data from this survey indicated that several wells were contaminated with volatile organic compounds (VOCs), primarily tetrachloroethylene (PCE).

Throughout 1997 and 1998, the SCDHS collected samples from approximately 150 homes throughout the Villages of Head of the Harbor and Nissequogue, and the Hamlet of St. James. Analytical results from this data indicated that 23 residences were contaminated with PCE at concentrations exceeding the State and Federal maximum contaminant level (MCL) of 5 parts per billion (ppb). Four of these residences had PCE concentrations exceeding EPA's Removal Action Level (RAL) of 70 ppb.

SCDHS has investigated eleven current and former commercial/industrial facilities (located east of the site) in the area in order to identify sources of the contaminated ground water plume. These investigations included the installation and subsequent sampling of monitoring wells in the area of these facilities. Based on a review of analytical data from this sampling, the specific origin of the ground water contamination has not been determined.

In April 1998, EPA sampled 295 homes in the area in an effort to determine the extent of PCE contamination. Samples were analyzed according to EPA Method 524.2 for specific VOCs. Analytical results from this sampling event indicated the presence of PCE in 33 residential wells at concentrations above the MCL. The RAL for PCE was exceeded in six of these wells. In addition, several homes had detectable concentrations of PCE below the MCL (i.e., 1-5 ppb).

As a result of the analytical results generated during the April 1998 sampling event, EPA began the delivery of bottled water to four of the six residences contaminated above the RAL with PCE. The other two residences had already had installed granular activated carbon (GAC) treatment systems. In June 1998, EPA expanded the delivery of bottled water to homes where the MCL for PCE or its breakdown products was exceeded and whose residents were interested in receiving bottled water. On July 23, 1998, an EPA Action Memorandum was signed, authorizing Removal Action activities to be conducted at the site. Removal Action activities proposed in this memorandum include the installation of GAC treatment units in homes with wells contaminated with PCE above State and Federal MCL of 5 ppb, and to continue to provide these homes with bottled water until the treatment systems are installed.

An observed release of PCE to ground water is documented by the chemical analyses of ground water samples collected from private drinking water wells in April 1998. Level I contamination is documented for 50 wells which serve a total of 156 people. All of these private wells are screened in the Upper Glacial or Magothy aquifers, which are interconnected and evaluated as the aquifer of concern.

SECTION II: HRS SCORESHEETS

PREScore 4.1 GROUND WATER MIGRATION PATHWAY SCORESHEET Smithtown Groundwater Contamination - 08/10/98

GROUND WATER MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release to an Aquifer Aquifer: Upper Glacial		
1. Observed Release 2. Potential to Release 2a. Containment 2b. Net Precipitation 2c. Depth to Aquifer 2d. Travel Time 2e. Potential to Release [lines 2a(2b+2c+2d)] 3. Likelihood of Release	550 10 10 5 35 500 550	550 N/A N/A N/A N/A 550
Waste Characteristics		
4. Toxicity/Mobility 5. Hazardous Waste Quantity 6. Waste Characteristics	* * 100	1.00E+02 100 10
Targets	1	
7. Nearest Well 8. Population 8a. Level I Concentrations 8b. Level II Concentrations 8c. Potential Contamination 8d. Population (lines 8a+8b+8c) 9. Resources 10. Wellhead Protection Area 11. Targets (lines 7+8d+9+10)	50 ** ** ** 5 20 **	5.00E+01 1.56E+03 0.00E+00 0.00E+00 1.56E+03 0.00E+00 0.00E+00 1.61E+03
12. Targets (including overlaying aquifers) 13. Aquifer Score	** 100	1.61E+03 100.00
GROUND WATER MIGRATION PATHWAY SCORE (Sgw)	100	100.00

^{*} Maximum value applies to waste characteristics category. ** Maximum value not applicable.

SECTION III: DOCUMENTATION RECORD

HRS DOCUMENTATION RECORD--REVIEW COVER SHEET

Name of Site:

Smithtown Ground Water Contamination

Contact Persons

Site Investigation:

Dennis J. Foerter (732) 225-6116

Region II START % Roy F. Weston, Inc.

Edison, NJ

Documentation Record:

Dennis Munhall

(212) 637-4343

U.S. Environmental Protection Agency

New York, NY

Dennis J. Foerter

(732) 225-6116

Region II START % Roy F. Weston, Inc.

Edison, NJ

Pathways, Components, or Threats Not Evaluated

An observed release to ground water by chemical analysis is documented. The Ground Water Migration Pathway alone produces an overall score well above the minimum required for the site to qualify for the National Priorities List; the score is supported by evidence of Level I contamination of private residential drinking water wells included in the site. This results in the maximum pathway score of 100.00 for the Ground Water Migration Pathway. The Potential to Release (Section 3.1.2), Resources (Section 3.3.3), and Wellhead Protection Area (Section 3.3.4) portions of the Ground Water Migration Pathway were not evaluated due to the maximized pathway score.

The Surface Water, Soil Exposure, and Air Pathways were not evaluated because the site score was not significantly impacted by those pathways.

HRS DOCUMENTATION RECORD

Name of Site: Smithtown Groundwater Contamination

EPA Region: 2 Date Prepared: August 1998

Street Address of Site: St. James, Nissequogue, and Head of the Harbor

County and State: Suffolk, NY

General Location in the State: Southeast

Topographic Map: Saint James, N.Y., quadrangle, 1967 (photorevised 1979)

Latitude: 40° 53' 16.1" North Longitude: 73° 10' 29.2" West

EPA ID No.: NY0002318889

Scores

Ground Water Pathway 100.00
Surface Water Pathway Not Scored
Soil Exposure Pathway Not Scored
Air Pathway Not Scored

HRS SITE SCORE 50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE

		<u>S</u>	S ²
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	100.00	10,000
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	Not Score	<u>d</u>
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	Not Score	<u>d</u>
2c.	Surface Water Migration Pathway Score ($S_{\mbox{\tiny SM}})$ Enter the larger of lines 2a and 2b as the pathway	Not Score	<u>d</u>
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	Not Score	<u>d</u>
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	Not Score	<u>d</u>
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_s^2$	10,000	
6.	HRS Site Score Divide the value on line 5 by 4 and take the square root	50.00	

REFERENCES

Reference

Number Description of the Reference

- 1. U.S. Environmental Protection Agency (USEPA), <u>Revised Hazard</u>
 <u>Ranking System, Final Rule</u>, 40 CFR 300, Appendix A, December 14,
 1990. [9 pp.]
- USEPA, <u>Superfund Chemical Data Matrix</u>, <u>SCDM Data Version</u>: <u>JUN96</u>, February 18, 1997. [3 pp.]
- 3. Rosoff, D. and Wilson, E., USEPA, Removal Action Branch, ACTION

 MEMORANDUM Subject: Documentation of Verbal Authorization and
 Request for a Removal Action and Ceiling Increase at the

 Smithtown Ground Water Site, Smithtown, Suffolk County, New York,

 July 23, 1971. [37 pp.]
- 4. Foerter, D., Region II Superfund Technical Assessment and Response Team (START), Project Note to Smithtown Ground Water Contamination file, Subject: June 29, 1998 Meeting with Suffolk County Department of Health Services, June 30, 1998. [1 p.]
- 5. Lubke, E.R., U.S. Department of the Interior Geological Survey (USGS), <u>Hydrgeology of the Huntington-Smithtown Area, Suffolk</u> <u>County, New York</u>, Geological Survey Water-Supply Paper 1699-D, 1964. [68 pp. and 3 plates]
- 6. McClymonds, N.E. and O.L. Franke, USGS, <u>Water-Transmitting</u>

 <u>Properties of Aquifers on Long Island, New York</u>, Geological

 Survey Professional Paper 627-E, 1972. [28 pp.]
- 7. Getzen, R.T., USGS, <u>Analog-Model Analysis of Regional Three-Dimensional Flow in the Ground-Water Reservoir of Long Island, New York</u>, Geological Survey Professional Paper 982, 1977. [54 pp.]
- 8. Spinello, A.G. et al, USGS Water Resources Division, <u>Water Resources Data, New York, Water Year 1996, Volume 2. Long Island, USGS Water-Data Report NY-96-2, excerpts, May 1997. [13 pp.]</u>
- 9. Foerter, D., Region II START, <u>Project Note to Smithtown Ground Water Contamination file, Subject: Site Location and Latitude/Longitude of the Smithtown Ground Water Contamination site</u>, September 14, 1998. [2 pp. and 1 topographic map]
- 10. Roy F. Weston, Inc., Region II START, <u>Tap Water Sampling Log</u>, <u>April 3-17</u>, <u>1998</u>, Smithtown Ground Water Contamination, Smithtown, New York, Document Control No. 02-266. [296 pp.]

REFERENCES (continued)

Reference

Number Description of the Reference

- 11. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0468</u>, May 10, 1998. [79 pp.]
- 12. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0475</u>, undated. [154 pp.]
- 13. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0476</u>, May 6, 1998. [192 pp.]
- 14. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0487</u>, May 8, 1998. [157 pp.]
- 15. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0486</u>, May 17, 1998. [169 pp.]
- 16. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0505</u>, May 14, 1998. [140 pp.]
- 17. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0521</u>, May 9, 1998. [128 pp.]
- 18. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0542</u>, May 20, 1998. [91 pp.]
- 19. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0551</u>, May 12, 1998. [116 pp.]
- 20. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0561</u>, May 25, 1998. [101 pp.]
- 21. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0571</u>, May 18, 1998. [138 pp.]

REFERENCES (continued)

Reference

Number Description of the Reference

- 22. Roy F. Weston, Inc., <u>Data Quality Objective</u>, <u>Document Control No. START-02-F-1788</u>, <u>Smithtown Long Island</u>, <u>Project No. 2500</u>, <u>SDG No. E0588</u>, May 24, 1998. [112 pp.]
- 23. Foerter, D., Region II START, <u>Project Note to Smithtown Ground Water Contamination file</u>, <u>Subject: Well Depths Smithtown Ground Water Contamination Site Study Area</u>, August 5, 1998. [13 pp.]
- 24. U.S. EPA, Solid Waste and Emergency Response, Office of Emergency and Remedial Response (5420G), <u>Quick Reference Fact Sheet: Using Qualified Data to Document an Observed Release and Observed Contamination</u>, EPA 540-F-94-028, OSWER 9285.7-14FS, PB94-963311, November 1996. [18 pp.]
- 25. Foerter, D., Region II START, <u>Project Note to Smithtown Ground Water Contamination file</u>, <u>Subject: Hydraulic Conductivity of the Upper Glacial and Magothy aguifers</u>, September 16, 1998. [3 pp.]

SOURCE DESCRIPTION

2.2 SOURCE CHARACTERIZATION

Number of the source: 1

Name and description of the source:

Ground water plume with no identified source (Other)

Source 1 is considered to be a contaminated ground water plume because an observed release attributable to a specific source has not been documented. The Suffolk County Department of Health Services (SCDHS) has identified eleven potential facilities which may have contributed to the contaminated plume. SCDHS has installed and subsequently sampled several monitoring wells in the area in an effort to identify sources to the ground water contamination. However, the specific origin of the contaminants detected in the Smithtown Ground Water Contamination site have not been pinpointed (Ref. 3, p. 3; 4).

The Smithtown Ground Water Contamination site consists of a contamination plume defined by Level I PCE concentrations. The plume is defined as containing residential wells identified as contaminated by PCE and meeting the criteria for an observed release (see Section 3.1). The contaminated wells are located in the Town of Smithtown, Suffolk County, New York. The area encompasses the Villages of Nissequogue and Head of the Harbor, and the Hamlet of St. James. The plume is situated south of the Stony Brook Harbor and east of the Nissequogue River (Ref. 3, pp. 2, 3).

Between 1996 and 1998, the SCDHS collected samples from the wells of approximately 150 homes located throughout Head of the Harbor, Nissequogue, and St. James. Analytical results from samples collected indicated that many of the wells in the area were contaminated with volatile organic compounds (VOCs), primarily tetrachloroethylene (PCE) (Ref. 3, p. 2, Appendix A).

As a followup to sampling activities conducted by SCDHS, EPA sampled 295 residential private wells in Head of the Harbor, Nissequogue, and St. James (Ref. 3, p. 2; 10). This sampling event was conducted from April 3, 1998 to April 17, 1998. Samples were analyzed for specific VOCs according to EPA Method 524.2 (Ref. 11, p. 2). Analytical results from this sampling event indicated the presence of PCE in many residential wells at concentrations exceeding the State and Federal maximum contaminant levels (MCLs) (5 ppb), with several wells exceeding EPA RALs (70 ppb)(Ref. 3, pp. 2, 3).

As a result of the PCE concentrations detected in private residential wells during the April 1998 sampling event, EPA began offering bottled water to residents where PCE was detected at concentrations above the State and Federal MCLs. In addition, EPA plans to conduct a Removal Action which will include the installation of GAC treatment units in homes with wells contaminated above State and Federal MCLs (Ref. 3, pp. 2, 3).

Location of the source, with reference to a map of the site:

The complete lateral and vertical extent of the ground water plume is unknown. The location of the plume is defined as the portion of the Upper Glacial/Magothy aquifer delineated by Level I target wells (Ref. 10-22). Figure 3 presents Level I PCE concentrations detected during the April 1998 sampling event conducted by EPA.

Containment

Release to ground water:

An observed release of contaminants (i.e., PCE) to ground water at concentrations significantly above background is documented by chemical analyses of samples collected from private residential wells by EPA in April 1998 (Ref. 10-22). Based on the fact that there is evidence of hazardous substance migration, and the fact that the source (i.e., the plume) has no liner, the containment factor for the ground water pathway is 10 (Ref. 1, pp. 4, 4A).

2.4.1 <u>Hazardous Substances</u>

Hazardous Substance	Evidence	<u>Reference</u>
PCE	EPA ground water sampling results (April 1998):	
	TW96 (33 Highwoods Ct.) TW80 (22 Carman Ln.) TW128 (300 River Rd.) TW128 (55 Swan Pl.) TW160 (271 Sachem Hill Pl.) TW139 (8 Tide Mill Rd.) TW298 (207 River Rd.) TW234 (7 Watercrest Ct.) TW200 (3 Watercrest Ct.) TW200 (3 Watercrest Ct.) TW201 (28 Harbor Hill Rd.) TW127 (23 Moriches Rd.) TW261 (11 Quail Path) TW251 (270 Sachem Hill Pl.) TW58 (7 Carman Ln.) TW16 (25 Harbor Rd.) TW307 (29 Highwoods Ct.) TW149 (3 Pinoak Ln.) TW62 (Branglebrink Rd.) TW321 (4 Watercrest Ct.) TW255 (262A Old Mill Rd.) TW176 (Cordwood Path) TW197 (15 Quail Path) TW305 (28 Highwoods Ct.) TW280 (1 Tide Mill Rd.) TW97 (9 Watercrest Ct.) TW271 (3 Tide Mill Rd.) TW311 (341 River Rd.) TW254 (263J Old Mill Rd.) TW311 (341 River Rd.) TW39 (9 Branglebrink Rd.) TW59 (9 Branglebrink Rd.) TW59 (9 Branglebrink Rd.) TW85 (Branglebrink Rd.) TW83 (7 Pinoak Ln.) TW273 (1 Harbor Ln.) TW242 (12 Quail Path) TW60 (15 Branglebrink Rd.) TW269 (207B River Rd.) TW73 (1 Carman Ln.) TW331 (3 Harbor Ln.) TW331 (54 Harbor Hill Rd.) TW331 (54 Harbor Hill Rd.)	10, p. 84; 19, p. 29 10, p. 71; 17, p. 50 10, p. 116; 21, p. 41 10, p. 48; 15, p. 79 10, p. 145; 12, p. 59 10, p. 125; 22, p. 29 10, p. 265; 16, p. 73 10, p. 211; 19, p. 53 10, p. 181; 15, p. 31 10, p. 288; 22, p. 61 10, p. 115; 21, p. 39 10, p. 235; 13, p. 108 10, p. 227; 13, p. 87 10, p. 53; 15, p. 95 10, p. 15; 12, p. 37 10, p. 273; 17, p. 32 10, p. 134; 22, p. 49 10, p. 57; 16, p. 37 10, p. 285; 22, p. 57 10, p. 229; 13, p. 96 10, p. 158; 13, p. 65 10, p. 178; 15, p. 25 10, p. 272; 17, p. 28 10, p. 250; 15, p. 57 10, p. 85; 19, p. 31 10, p. 244; 14, p. 76 10, p. 228; 13, p. 94 10, p. 275; 20, p. 69 10, p. 23; 13, p. 33 10, p. 97; 20, p. 31 10, p. 74; 18, p. 37 10, p. 54; 15, p. 97 10, p. 73; 18, p. 31 10, p. 74; 18, p. 37 10, p. 54; 15, p. 97 10, p. 245; 14, p. 80 10, p. 219; 20, p. 51 10, p. 55; 15, p. 97 10, p. 54; 14, p. 80 10, p. 219; 20, p. 51 10, p. 55; 15, p. 97 10, p. 54; 14, p. 80 10, p. 243; 14, p. 72 10, p. 67; 16, p. 57 10, p. 82; 19, p. 23 10, p. 131; 22, p. 43 10, p. 294; 22, p. 73 10, p. 141; 12, p. 51
	TW291 (6 Swan Pl.)	10, p. 258; 16, p. 79

2.4.1	Hazardous Substances (continued	
Hazardous <u>Substance</u>	<u>Evidence</u>	Reference
PCE	TW277 (12 Harbor Ln.) TW243 (262M Old Mill Rd.) TW181 (16 Carman Ln.) TW54 (26 Cordwood Path.) TW07 (46 Harbor Hill Rd.) TW275 (2 Tide Mill Rd.) TW212 (20 Teal Way)	10, p. 248; 15, p. 49 10, p. 220; 20, p. 53 10, p. 163; 13, p. 75 10, p. 50; 15, p. 87 10, p. 7; 11, p. 28 10, p. 246; 14, p. 84 10, p. 191; 16, p. 31

2.4.2 <u>Hazardous Waste Quantity</u>

2.4.2.1.1 <u>Hazardous Constituent Quantity</u>

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous waste constituent is not scored (NS).

Hazardous Constituent Quantity Value (S): NS

2.4.2.1.2 <u>Hazardous Wastestream Quantity</u>

The information available is not sufficient to evaluated Tier B source hazardous waste quantity.

Hazardous Wastestream Quantity Value (W): NS

2.4.2.1.3 <u>Volume</u>

Based on analytical results of ground water samples collected by EPA in April 1998, it is apparent that some amount of contamination is present; however, the exact volume is unknown. A source waste quantity of >0 will therefore be assigned.

Volume Assigned Value: >0

Reference: 10-22

2.4.2.1.4 Area

Area measurement (Tier D)cannot be evaluated, since Hazardous Waste Quantity Table 2-5 does not provide a divisor for the source type "other" in this tier.

Area of source (ft²): not evaluated

Area Assigned Value: N/A

Reference(s): 1, p. 2

2.4.2.1.5 Source Hazardous Waste Quantity Value

The contaminated ground water plume in the vicinity of the Smithtown Ground Water Contamination site is considered to be the source. To date, no source has been identified (Ref. 3, p. 3; 4). Analytical results of ground water samples collected by EPA in April 1998, indicate that some amount of contamination is present; however, the exact volume is unknown (Ref. 10-22). Therefore, a source waste quantity of >0 is assigned.

SD-Summary

SITE SUMMARY OF SOURCE DESCRIPTIONS

			<u>Containment</u>		
Source <u>Number</u>	Source Hazardous Waste <u>Quantity Value</u>	Ground Water	Surface <u>Water</u>	Gas	Air <u>Particulate</u>
1	>0	10	NE	NE	NE

NE = Not Evaluated

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 General Considerations

The aquifer of concern is referred to in this report as the combined Upper Glacial/Magothy aquifer. It consists of the Upper Glacial and Magothy aquifers that underlie the Smithtown area (Ref. 5, pp. D1, D2, D28, D33; 6, pp. 4, 5, 6). Ground water is the only source of water-supply in Suffolk County, and most of the ground-water pumpage occurs within those two aquifers (Ref. 5, pp. D2, D23; 7, p. 1). The aquifers are hydraulically interconnected (Ref. 5, pp. D22, D28, D41, D42) and are evaluated as a single hydrologic unit (i.e., the aquifer of concern) for HRS scoring purposes (Ref. 1, p. 4).

The total thickness of the formations comprising the Upper Glacial/Magothy aquifer is approximately 500 feet in the site vicinity (Ref. 5, plates 1 and 4; 7, p. 9). The water table occurs in the surficial Upper Glacial aquifer, or in the Magothy in very localized areas, and there are no continuous confining layers between the two units (Ref. 5, pp. D22, D28, D29). The highest seasonal level of ground water in the Smithtown area is approximately 30 feet below ground surface (Ref. 8, pp. 42, 176). Ground water flow direction in the site vicinity is generally to the north, however, there are flow components toward the surface water bodies (i.e., Stony Brook Harbor and Nissequogue River)on the east and west in the northern part of the study area (Ref. 5, p. D29, plate 5). Typical hydraulic conductivity values range from approximately 1.85 x 10^{-2} centimeters per second (cm/s) in the Magothy aquifer to 4.62×10^{-2} cm/s in the Upper Glacial aquifer (Ref. 7, p. 15; 25).

The Magothy is underlain by the Raritan Clay, a continuous confining layer that separates the deeper Lloyd aquifer from the overlying aquifer system (Ref. 6, pp. E4, E6; 7, p. 7). The Lloyd aquifer has not been developed extensively in Suffolk County (Ref. 5, pp. D2, D13) and is not evaluated as an aquifer of concern.

Bedrock Aquifer/Stratum 1 (shallowest)

Stratum Name:

Upper Glacial aquifer

<u>Description</u>: The Pleistocene-age Upper Glacial aquifer consists primarilay of glaciofluvial and glaciodeltaic sand and gravel. This geologic unit also contains tills, glaciolacustrine clays, and undifferentiated Pleistocene deposits (Ref. 5, pp. D16, D20; 7, p. 8). The average thickness of Pleistocene deposits in the Smithtown area is approximately 200 feet (Ref. 5, p. D20). The Pleistocene deposits are the most important source of water for domestic wells in the Smithtown area (Ref. 5, p. D23).

Bedrock Aquifer/Stratum 2

Stratum Name:

Magothy aquifer

<u>Description</u>: The Cretaceous-age Magothy aquifer consists of fine to medium sand interbedded with clay which is sometimes sandy or silty. The sand beds are generally less than 47 feet thick, but there are interbedded sandy zones that exceed 160 feet (Ref. 7, p. 7). The Magothy aquifer is approximately 300 to 400 feet thick in the Smithtown area (Ref. 5, plate 4).

Aquifer/Stratum 3

Aquifer/Stratum Name:

Raritan Clay (aquiclude)

<u>Description:</u> The Raritan Clay consists of solid, silty clay with few lenses of sand and little gravel (Ref. 6, p. E6). It has a thickness averaging 170 feet throughout the Smithtown area (Ref. 5, p. D12). It has a low hydraulic conductivity and acts as a confining layer to separate the Magothy and Lloyd aquifers (Ref. 7, p. 7).

Aquifer/Stratum 4

Aquifer/Stratum Name:

Lloyd aquifer

<u>Description:</u> The Lloyd sand member of the Cretaceous-age Raritan formation makes up the Lloyd aquifer. It consists of fine to coarse sand and gravel in a clayey matrix (Ref. 6, p. E6). The unit directly overlies the bedrock and is confined by the Raritan Clay (Ref. 5, p. D12; 7, p. 7). The Lloyd aquifer is used for only a small percentage of the water supply in the area (Ref. 5, p. D2).

3.1 LIKELIHOOD OF RELEASE

3.1.1 Observed Release

Aquifer Being Evaluated: Upper Glacial/Magothy aquifer

From April 3, 1998 to April 17, 1998, EPA collected ground water samples from the private residential potable wells of 295 homes (Ref. 10). A review of analytical data from this sampling event indicates that there is an observed release of PCE to the aquifer of concern. (i.e., Upper Glacial/Magothy aquifers).

Based on a review of local and regional geologic publications, and an interview with an SCDHS geologist, private wells in the area are screened in the Upper Glacial aquifer; however, deeper private wells may be screened in the underlying Magothy aquifer (Ref. 4). Background information indicates that the Upper Glacial and Magothy aquifers are hydraulically interconnected. No continuous confining layers exist between the two aquifers, and neither aquifer has a difference in hydraulic conductivity at or greater than two orders of magnitude from the other (Ref. 5, pp. D22, D28, D29; 7, p. 15). Therefore, the Upper Glacial and Magothy aquifers are evaluated as a single hydrologic unit (i.e., the aquifer of concern) for HRS scoring purposes.

Chemical Analysis

An observed release of PCE to ground water is documented by the chemical analysis of ground water samples collected from private wells during April 1998. PCE was detected in contaminated samples at concentrations exceeding the cancer-risk benchmark concentration of 1.6 ppb (Ref. 2, p.3). PCE was not detected in background samples. Background samples were collected from wells which were determined to be outside the influence of contamination from the plume (see Figure 2). All background wells, as well as contaminated wells, are considered to be drawing from the Upper Glacial/Magothy aquifer (Ref. 4; 10-23). All samples were analyzed for specific Volatile Organic Compounds (VOCs) in accordance with EPA Method 524.2. Analytical data was evaluated according to the U.S. EPA Region II Functional Guidelines and Quality Control criteria set forth in Region II U.S. EPA Method CLP/SOW OLMO3.1(SOP HW-6, Revision 10, October 1995)(Ref. 11-22). Samples listed below were collected prior to treatment (Ref. 10).

Background Concentrations

Sample ID	Well Location*	<u>Date</u>	References
TW154	12 Three Sisters Rd.4	4/3/98	10, p. 139; 11, p.
TW215	16 Three Sisters Rd.	4/9/98	10, p. 194; 17, p. 56
TW140	21 Three Sisters Rd.	4/16/98	10, p. 126; 22, p. 31
TW20	44A Woodcrest Dr.	4/4/98	10, p. 19; 12, p. 45

Background Concentrations (continued)

Sample <u>ID</u>	Well Location*	<u>Date</u>	References
TW184	44 Woodcrest Dr.	4/5/98	10, p. 166; 13, p. 81
TW179	10 Woodcutters Path	4/5/98	10, p. 161; 13, p. 71

* Background samples were collected from wells which were determined to be outside the influence of contamination from the plume. All background wells are considered to be drawing from the Upper Glacial/Magothy aquifer. Wells which were contaminated with Level I concentrations of PCE also draw from the Upper Glacial/Magothy aquifer (Ref. 4; 10-23).

Sample ID	Hazardous <u>Substance</u>	Conc (ppb)	Quantitation Limit (ppb)	Reference
TW154	PCE	not detected	0.5	11, p. 40
TW215	PCE	not detected	0.5	17, p. 56
TW140	PCE	not detected	0.5	22, p. 31
TW20	PCE	not detected	0.5	12, p. 45
TW184	PCE	not detected	0.5	13, p. 81
TW179	PCE	not detected	0.5	13, p. 71

Contaminated Samples

Sample			
<u>ID</u>	Well Location**	<u>Date</u>	<u>References</u>
TW96	33 Highwoods Ct.	4/14/98	10, p. 84; 19, p. 29
TW80	22 Carman Ln.	4/9/98	10, p. 71; 17, p. 50
TW128	300 River Rd.	4/16/98	10, p. 116; 21, p. 41
TW51	5 Swan Pl.	4/7/98	10, p. 48; 15, p. 79
TW160	271 Sachem Hill Pl.	4/4/98	10, p. 145; 12, p. 59
TW139	8 Tide Mill Rd.	4/16/98	10, p. 125; 22, p. 29
TW298	207 River Rd.	4/8/98	10, p. 265; 16, p. 73
TW234	7 Watercrest Ct.	4/14/98	10, p. 211; 19, p.
			53
TW200	3 Watercrest Ct.	4/7/98	10, p. 181; 15, p. 31
TW325	28 Harbor Hill Rd.	4/17/98	10, p. 288; 22, p. 61
TW127	23 Moriches Rd.	4/16/98	10, p. 115; 21, p.
			39
TW261	11 Quail Path	4/5/98	10, p. 235; 13, p.
			108
TW251	270 Sachem Hill Pl.	4/5/98	10, p. 227; 13, p.
			87
TW58	7 Carman Ln.	4/7/98	10, p. 53; 15, p. 95
TW16	25 Harbor Rd.	4/4/98	10, p. 15; 12, p. 37
TW307	29 Highwoods Ct.	4/9/98	10, p. 273; 17, p. 32
TW149	3 Pinoak Ln.	4/17/98	10, p. 134; 22, p. 49
******	5 I INOUN DII.	4/1//30	10, p. 134; 22, p. 49

Sample			
<u>ID</u>	Well Location**	<u>Date</u>	References
TW62	Branglebrink Rd(Gilison)	4/8/98	10, p. 57; 16, p. 37
TW321	4 Watercrest Ct.	4/17/98	10, p. 285; 22, p. 57
TW255	262A Old Mill Rd.	4/5/98	10, p. 229; 13, p. 96
TW176	Cordwood Path (Greshin)	4/5/98	10, p. 158; 13, p. 65
TW197	15 Quail Path	4/7/98	10, p. 178; 15, p. 25
TW305	28 Highwoods Ct.	4/9/98	10, p. 272; 17, p. 28
TW280	1 Tide Mill Rd.	4/7/98	10, p. 250; 15, p. 57
TW97	9 Watercrest Ct.	4/14/98	10, p. 85; 19, p. 31
TW271	3 Tide Mill Ln.	4/6/98	10, p. 244; 14, p.
TW254	263J Old Mill Rd.	4/5/98	10, p. 228; 13, p. 94
TW311	341 River Rd.	4/15/98	10, p. 275; 20, p. 69
TW25	37 Branglebrink Rd.	4/5/98	10, p. 23; 13, p. 33
TW109	245K Old Mill Rd.	4/15/98	10, p. 97; 20, p. 31
TW85	Branglebrink Rd (Krauth)	4/13/98	10, p. 74; 18, p. 37
TW59	9 Branglebrink Rd.	4/7/98	10, p. 54; 15, p. 97
TW83	7 Pinoak Ln.	4/13/98	10, p. 73; 18, p. 31
TW273	1 Harbor Ln.	4/6/98	10, p. 245; 14, p. 80
TW242	12 Quail Path	4/15/98	10, p. 219; 20, p. 51
TW60	15 Branglebrink Rd.	4/7/98	10, p. 55; 15, p. 99
TW269	207B River Rd.	4/6/98	10, p. 243; 14, p. 72
TW73	1 Carman Ln.	4/8/98	10, p. 67; 16, p. 57
TW93	3 Harbor Ln.	4/14/98	10, p. 82; 19, p. 23
TW146	261P Old Mill Rd.	4/17/98	10, p. 131; 22, p. 43
TW331	54 Harbor Hill Rd.	4/17/98	10, p. 294; 22, p. 73
TW156	194A River Rd.	4/4/98	10, p. 141; 12, p. 51
TW291	6 Swan Pl.	4/7/98	10, p. 258; 16, p. 79
TW277	12 Harbor Ln.	4/7/98	10, p. 248; 15, p. 51
TW243	262M Old Mill Rd.	4/15/98	10, p. 220; 20, p. 53
TW181	16 Carman Ln.	4/5/98	10, p. 163; 13, p. 75
TW54	26 Cordwood Path	4/7/98	10, p. 50; 15, p. 87
TWO7	46 Harbor Hill Rd.	4/3/98	10, p. 7; 11, p. 28
TW275	2 Tide Mill Rd.	4/6/98	10, p. 246; 14, p. 84
TW212	20 Teal Way	4/8/98	10, p. 191; 16, p. 31

** Wells listed above are Level I contaminated wells which are considered to be drawing from the Upper Glacial/Magothy aquifer (Ref. 4; 10-23)

Sample 	Hazardous Substance	Conc (ppb)	Sample Quantitation Limit (ppb)	Reference
TW96	PCE	38	0.5	19, p. 29
TW80	PCE	15	0.5	17, p. 50
TW128	PCE	1.6	0.5	21, p. 41
TW51	PCE	150	2.5	15, p. 79
TW160	PCE	8.3	0.5	12, p. 59
TW139	PCE	2.2	0.5	22, p. 29
TW298	PCE	6.0	5.0	16, p. 73
TW234	PCE	160	0.5	19, p. 53
TW200	PCE	180 J	6.25	15, p. 31
TW325	PCE	3.8	0.5	22, p. 61
TW127	PCE	2.9	0.5	21, p. 39
TW261	PCE	1.8	0.5	13, p. 108
TW251	PCE	12	0.5	13, p. 87
TW58	PCE	3.5	0.5	15, p. 95
TW16	PCE	5.6	0.5	12, p. 37
TW307	PCE	110	2.5	17, p. 32
TW149	PCE	2.8	0.5	22, p. 49
TW62	PCE	11	0.5	16, p. 37
TW321	PCE	120 J	2.5	22, p. 57
TW255	PCE	3.8	0.5	13, p. 96
TW176	PCE	7.7	0.5	13, p. 65
TW197	PCE	2.0	0.5	15, p. 25
TW305	PCE	7.3	0.5	17, p. 28
TW280	PCE	4.6	0.5	15, p. 57
TW97	PCE	2.1	0.5	19, p. 31
TW271	PCE	4.4	0.5	14, p. 76
TW254	PCE	7.0	0.5	13, p. 94
TW311	PCE	1.8	0.5	20, p. 69
TW25	PCE	14	0.5	13, p. 33
TW109	PCE	5.0	0.5	20, p. 31
TW85	PCE	11	0.5	18, p. 37
TW59	PCE	9.3	0.5	15, p. 97
TW83	PCE	4.9	0.5	18, p. 31
TW273	PCE	2.0	0.5	14, p. 80
TW242	PCE	1.7	0.5	20, p. 51
TW60	PCE	2.5	0.5	15, p. 99
TW269	PCE	2.1	0.5	14, p. 72
TW73	PCE	36	0.5	16, p. 57
TW93	PCE	9.0	0.5	19, p. 23
TW146	PCE	1.6	0.5	22, p. 43
TW331	PCE	7.4	0.5	22, p. 73

Sample	Hazardous		Sample Quantitation	
ID	<u>Substance</u>	Conc (ppb)	<u>Limit (ppb)</u>	<u>Reference</u>
TW156	PCE	1.6	0.5	12, p. 51
TW291	PCE	82 J	2.5	16, p. 79
TW277	PCE	3.1	0.5	15, p. 49
TW243	PCE	2.1	0.5	20, p. 53
TW181	PCE	17	0.5	13, p. 75
TW54	PCE	33	0.5	15, p. 87
TWO7	PCE	2.1	0.5	11, p. 28
TW275	PCE	6.9	0.5	14, p. 84
TW212	PCE	3.6	0.5	16, p. 31

Notes:

J - Analyte was positively identified. Reported value may not be accurate or precise (Ref. No. 14, p. 11)

Three of the contaminated samples (TW291, TW200, and TW321) were qualified as estimated during the data validation review. These estimated concentrations of PCE were evaluated in accordance with guidance specified in "Using Qualified Data to Document an Observed Release and Observed Contamination" (EPA 540-F-94-028, November 1996). This evaluation indicates that all three samples meet the criteria for an observed release. The results of this evaluation are as follows:

- Sample TW291 was estimated and biased low due to overdilution and holding time exceedance (Ref. 16, p. 4). In accordance with the above guidance, the reported concentration was used without any factors. Therefore, the concentration (82 ppb) was used (Ref. 24, p. 8).
- A review of the validated data packages for samples TW200 and TW321 do not indicate if these samples were biased high or low. The samples were qualified as estimated due to overdilution. To be conservative, the reported concentrations were divided by the adjustment factor for PCE (10), in accordance with the above guidance (Ref. 24, pp. 8, 12). This resulted in an adjusted concentration of 18 ppb for sample TW200 and 12 ppb for sample TW321.

Level I Samples

Sample ID: All contaminated samples listed above

Reference for Benchmarks: No. 2, p. 3

Hazardous

Cancer-risk

<u>Substance</u>

Benchmark Concentration

PCE

1.6E-03 (1.6 ppb)

Attribution:

SCDHS has investigated eleven current and former commercial/industrial facilities (located east of the site) in the area in order to identify sources of the contaminated ground water plume. These investigations included the installation and subsequent sampling of monitoring wells in the area of these facilities. Based on a review of analytical data from this sampling, the specific origin of the ground water contamination has not been determined. (Ref. 3, p. 3; 4).

<u>Hazardous Substances Released:</u>

PCE

Based on analytical results from the EPA sampling event conducted in April 1998, an observed release (by chemical analysis) to ground water is documented; therefore, a ground water observed release factor value of 550 is assigned (Ref. 1, p. 4).

3.2 WASTE CHARACTERISTICS

3.2.1 Toxicity/Mobility

Hazardous	Source	Toxicity	Mobility	Toxicity/	Reference
<u>Substance</u>	No.	<u>Factor Value</u>	<u>Factor Value</u>	Mobility	
PCE	1	100	1	100	2, p. 2

3.2.2 Hazardous Waste Quantity

Source Hazardous Is source hazardous
Waste Quantity constituent quantity
Source Number Value (Section 2.4.2.1.5) data complete? (yes/no)

1 >0 No

Sum of Values: >0

The hazardous waste quantity value is >0. Based on the fact that targets are subject to Level I concentrations of PCE, a hazardous waste quantity factor value of 100 can be assigned if it is greater than the hazardous waste quantity value. Therefore, a hazardous waste quantity factor value of 100 is assigned for the ground water pathway (Ref. 1, pp. 2, 3).

3.2.3 Waste Characteristics Factor Category Value

Toxicity/Mobility Factor Value (100) x Hazardous Waste Quantity Factor Value (100): 1 x 104

The product 1 x 10^4 corresponds to a waste characteristics factor category value of 10 in Table 2-7 of the HRS rule (Ref. 1, pp. 3).

3.3 TARGETS

The wells listed below are private wells which were sampled by EPA in April 1998 and determined to have Level I contamination of PCE.

	Distance From		Level I	Level II	Potential	Conton
Well	Centroid *	Aquifer**	(Y/N)	Contam. (Y/N)	Contam. (Y/N)	Contam. <u>Reference</u>
<u>NCII</u>	<u>oencrora</u>	Aguitei	11/11	<u> </u>	(1/1/)	Veletelice
TW96	0.00 mile	UPGL/MAG	Y	N	N	19, p. 29
TW80	0.00 mile	UPGL/MAG	Y	N	N	17, p. 50
TW128	0.00 mile	UPGL/MAG	Y	N	N	21, p. 41
TW51	0.00 mile	UPGL/MAG	Y	N	N	15, p.79
TW160	0.00 mile	UPGL/MAG	Y	N	N	12, p. 59
TW139	0.00 mile	UPGL/MAG	Y	N	N	22, p. 29
TW298	0.00 mile	UPGL/MAG	Y	N	N	16, p. 73
TW234	0.00 mile	UPGL/MAG	Y	N	N	19, p. 53
TW200	0.00 mile	UPGL/MAG	Y	N	N	15, p. 31
TW325	0.00 mile	UPGL/MAG	Y	N	N	22, p. 61
TW127	0.00 mile	UPGL/MAG	Y	N	N	21, p. 39
TW261	0.00 mile	UPGL/MAG	Y	N	N	13, p. 108
TW251	0.00 mile	UPGL/MAG	Y	N	N	13, p. 87
TW58	0.00 mile	UPGL/MAG	Y	N	N	15, p. 95
TW16	0.00 mile	UPGL/MAG	Y	N	N	12, p. 37
TW307	0.00 mile	UPGL/MAG	Y	N	N	17, p. 32
TW149	0.00 mile	UPGL/MAG	Y	N	N	22, p. 49
TW62	0.00 mile	UPGL/MAG	Y	N	N	16, p. 37
TW321	0.00 mile	UPGL/MAG	Y	N	N	22, p. 57
TW255	0.00 mile	UPGL/MAG	Y	N	N	13, p. 96
TW176	0.00 mile	UPGL/MAG	Y	N	N	13, p. 65
TW197	0.00 mile	UPGL/MAG	Y	N	N	15, p. 25
TW305	0.00 mile	UPGL/MAG	Y	N	N	17, p. 28
TW280	0.00 mile	UPGL/MAG	Y	N	N	15, p. 57
TW97	0.00 mile	UPGL/MAG	Y	N	N	19, p. 31
TW271	0.00 mile	UPGL/MAG	Y	N	N	14, p. 76
TW254	0.00 mile	UPGL/MAG	Y	N	N	13, p. 94
TW311	0.00 mile	UPGL/MAG	Y	N	N	20, p. 69
TW25	0.00 mile	UPGL/MAG	Y	N	N	13, p. 33
TW109	0.00 mile	UPGL/MAG	Y	N	N	20, p. 31
TW85	0.00 mile	UPGL/MAG	Y	N	N	18, p. 37
TW59	0.00 mile	UPGL/MAG	Y	N	N	15, p. 97
TW83	0.00 mile	UPGL/MAG	Y	N	N	18, p. 31
TW273	0.00 mile	UPGL/MAG	Y	N	N .	14, p. 80
TW242	0.00 mile	UPGL/MAG	Y	N	N	20, p. 51
TW60	0.00 mile	UPGL/MAG	Y	N	N	15, p. 99
TW269	0.00 mile	UPGL/MAG	Y	N	N	14, p. 72
TW73	0.00 mile	UPGL/MAG	Y	N	N	16, p. 57
TW93	0.00 mile	UPGL/MAG	Y	N	N	19, p. 23
TW146	0.00 mile	UPGL/MAG	Y	N	N	22, p. 43
TW331	0.00 mile	UPGL/MAG	Y	N	N	22, p. 73
TW156	0.00 mile	UPGL/MAG	Y	N	N	12, p. 51
TW291	0.00 mile	UPGL/MAG	Y	N	N	16, p. 79

3.3 TARGETS (continued)

	Distance From	n	Level I	Level II Contam.	Potential Contam.	Contam.
<u>Well</u>	<pre>Centroid *</pre>	Aquifer**	(Y/N)	(Y/N)	(Y/N)	Reference
TW277	0.00 mile	UPGL/MAG	Y	N	N	15, p. 49
TW243	0.00 mile	UPGL/MAG	Y	N	N	20, p. 53
TW181	0.00 mile	UPGL/MAG	Y	N	N	13, p. 75
TW54	0.00 mile	UPGL/MAG	Y	N	N	15, p. 87
TWO7	0.00 mile	UPGL/MAG	Y	N	N	11, p. 28
TW275	0.00 mile	UPGL/MAG	Y	N	N	14, p. 84
TW212	0.00 mile	UPGL/MAG	Y	N	N	16, p. 31

^{*} The source is the contamination plume defined by Level I PCE concentrations detected in the above-mentioned wells. Since these wells are included in the source, the distance of these wells from the source is 0.00 miles.

^{**} UPGL/MAG = Upper Glacial and Magothy aquifers

3.3.1 Nearest Well

Well: 263J Branglebrink Rd.

The well located at 263J Branglebrink Road is evaluated as the nearest well. This well has been determined to have Level I concentrations of PCE and is located near the center of the estimated plume area (see Figure 3); therefore, a nearest well value of 50 is assigned.

Level of Contamination (I, II, or potential): Level I

(Ref. 1, p. 7; 10, p. 228; 13, p. 94)

Nearest Well Factor Value: 50

3.3.2 Population

3.3.2.2 Level I Concentrations

Level I Well	Population	Reference
TW96 (33 Highwoods Ct Affa)	2	10, p. 84; 19, p. 29
TW80 (22 Carman Ln Avellino)	2	10, p. 71; 17, p. 50
TW128 (300 River Rd Badolato)	3	10, p. 116; 21, p. 41
TW51 (5 Swan Pl Beighley)	3	10, p. 48; 15, p. 79
TW160 (271 Sachem Hill Pl Bishop)	1	10, p. 145; 12, p. 59
TW139 (8 Tide Mill Rd Brooks)	3	10, p. 125; 22, p. 29
TW298 (207 River Rd Cantillo)	4	10, p. 265; 16, p. 73
TW234 (7 Watercrest Ct Chang)	3	10, p. 211; 19, p. 53
TW200 (3 Watercrest Ct Citrangola)	3	10, p.181; 15, p. 31
TW325 (28 Harbor Hill Rd Curth)	4	10, p. 288; 22, p. 61
TW127 (23 Moriches Rd DeLayer) TW261 (11 Quail Path - Dolce)	3	10, p. 115; 21, p. 39
TW251 (270 Sachem Hill Pl Drucker)	2	10, p. 235; 13, p. 108
TW58 (7 Carman Ln Dunton)	3	10, p. 227; 13, p. 87 10, p. 53; 15,
TW16 (25 Harbor Rd Edwards)	4	p. 95 10, p. 15; 12,
TW307 (29 Highwoods Ct Ellinger)	5	p. 37 10, p. 273; 17,
TW149 (3 Pinoak Ln Felicetti)	3	p. 32 10, p. 134; 22,
TW62 (Branglebrink Rd Gillison)	2	p. 49 10, p. 57; 16,
TW321 (4 Watercrest Ct Gnolfo)	6	p. 37 10, p. 285; 22,
TW255 (262A Old Mill Rd Grant)	3	p. 57 10, p. 229; 13,
TW176 (Cordwood Path - Greshin)	2	p. 96 10, p. 158; 13,
TW197 (15 Quail Path - Hagenberger)	2	p. 65 10, p. 178; 15, p. 25

3.3.2.2 Level I Concentrations (continued)

Level I Well	<u>Population</u>	Reference
TW305 (28 Highwoods Ct Hand)	2	10, p. 272; 17, p. 28
TW280 (1 Tide Mill Rd Hauptman)	2	10, p. 250; 15, p. 57
TW97 (9 Watercrest Ct Hayes)	5	10, p. 85; 19,
TW271 (3 Tide Mill Ln Heller)	2	p. 31 10, p. 244; 14,
TW254 (263J Old Mill Rd Jasnow)	3	p. 76 10, p. 228; 13,
TW311 (341 River Rd Kildale)	5	p. 94 10, p. 275; 20,
TW25 (37 Branglebrink Rd Klein)	2	p. 69 10, p. 23; 13,
TW109 (245K Old Mill Rd Koke)	4	p. 33 10, p. 97; 20,
TW85 (Branglebrink Rd Krauth)	2	p. 31 10, p. 74; 18,
TW59 (9 Branglebrink Rd Lieffrig)	3	p. 37 10, p. 54; 15,
TW83 (7 Pinoak Ln Link)	3	p. 97 10, p. 73; 18 p.
TW273 (1 Harbor Ln Madama)	3	31 10, p. 245; 14,
TW242 (12 Quail Path - Marchello)	4	p. 80 10, p. 219; 20,
TW60 (15 Branglebrink Rd Mee)	2	p. 51 10, p. 55; 15,
TW269 (207B River Rd Muurisepp)	5	p. 99 10, p. 243; 14,
TW73 (1 Carman Ln Peeling)	2	p. 72 10, p. 67; 16,
TW93 (3 Harbor Ln Pollina)	3	p. 57 10, p. 82; 19,
TW146 (261P Old Mill Rd Pugliese)	1	p. 23 10, p. 131; 22,
TW331 (54 Harbor Hill Rd Randall)	4	p. 43 10, p. 294; 22,
TW156 (194A River Rd Raustiala)	2	p. 73 10, p. 141; 12,
TW291 (6 Swan Pl Richman)	3	p. 51 10, p. 258; 16,
TW277 (12 Harbor Ln Ryan)	4	p. 79 10, p. 248; 15,
. ,		p. 49

3.3.2.2 Level I Concentrations (continued)

Level I Well	<u>Population</u>	Reference
TW243 (262M Old Mill Rd Santiago)	6	10, p. 220; 20,
TW181 (16 Carman Ln Silverman)	2	p. 53 10, p. 163; 13, p. 75
TW54 (26 Cordwood Path Spangher)	6	10, p. 50; 15, p. 87
TW07 (46 Harbor Hill Rd Swanson)	2	10, p. 7; 11, p. 28
TW275 (2 Tide Mill Rd Sweeney)	4	10, p. 246; 14, p. 84
TW212 (20 Teal Way - Zecchine)	5	10, p. 191; 16, p. 31

Total population served

Based on the above information, the Level I concentration factor value is 1,560. This value is obtained by multiplying the total population served by wells subject to Level I concentrations by $10 \ (156 \ x \ 10 = 1,560)$ (Ref. 1, p. 7).

3.3.2.3 Level II Concentrations

Level II Well	<u>Population</u>	Reference
Not Scored (NS).	NS	N/A

Population Served by Level II Wells: 0

3.3.2.4 Potential Contamination

Potential Contamination was not evaluated (NE), as a maximum score for the ground water pathway was achieved by evaluating Level I populations.

Distance <u>Category</u>	<u>Population</u>	<u>Reference</u>	Distance-Weigted Population Value
NS	NS	NS	NS

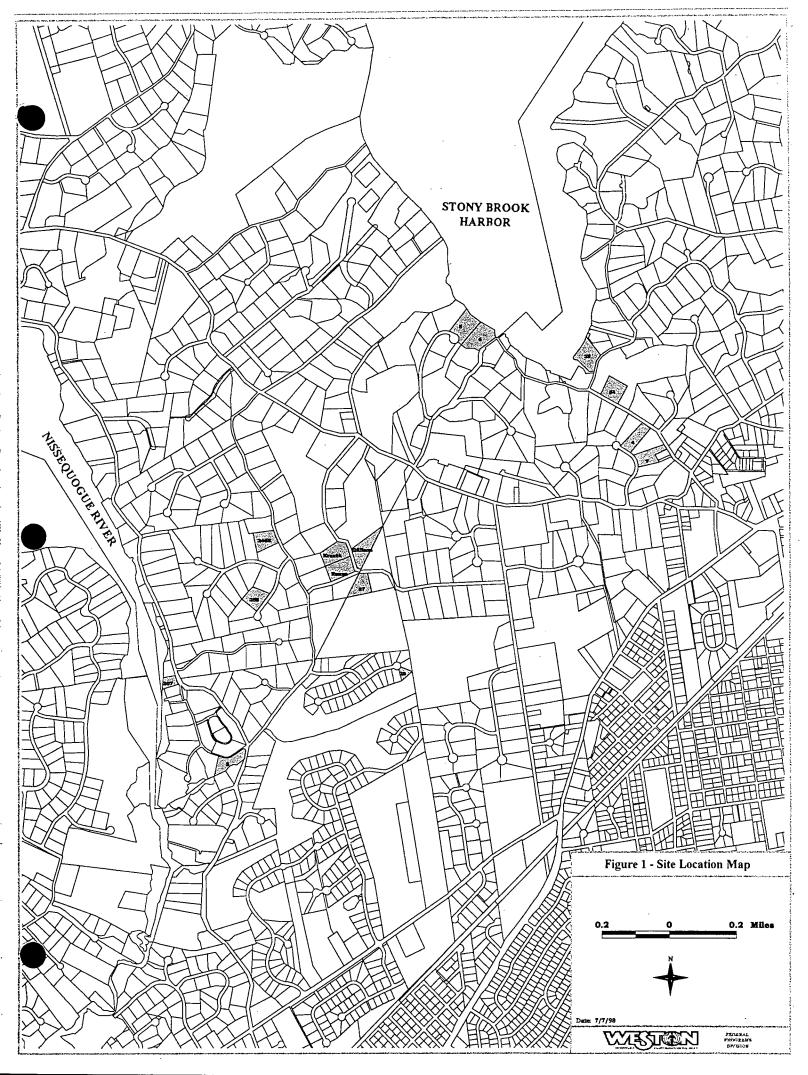
3.3.3 Resources

Resources were not evaluated, as a maximum score for the ground water pathway was achieved by evaluating Level I populations.

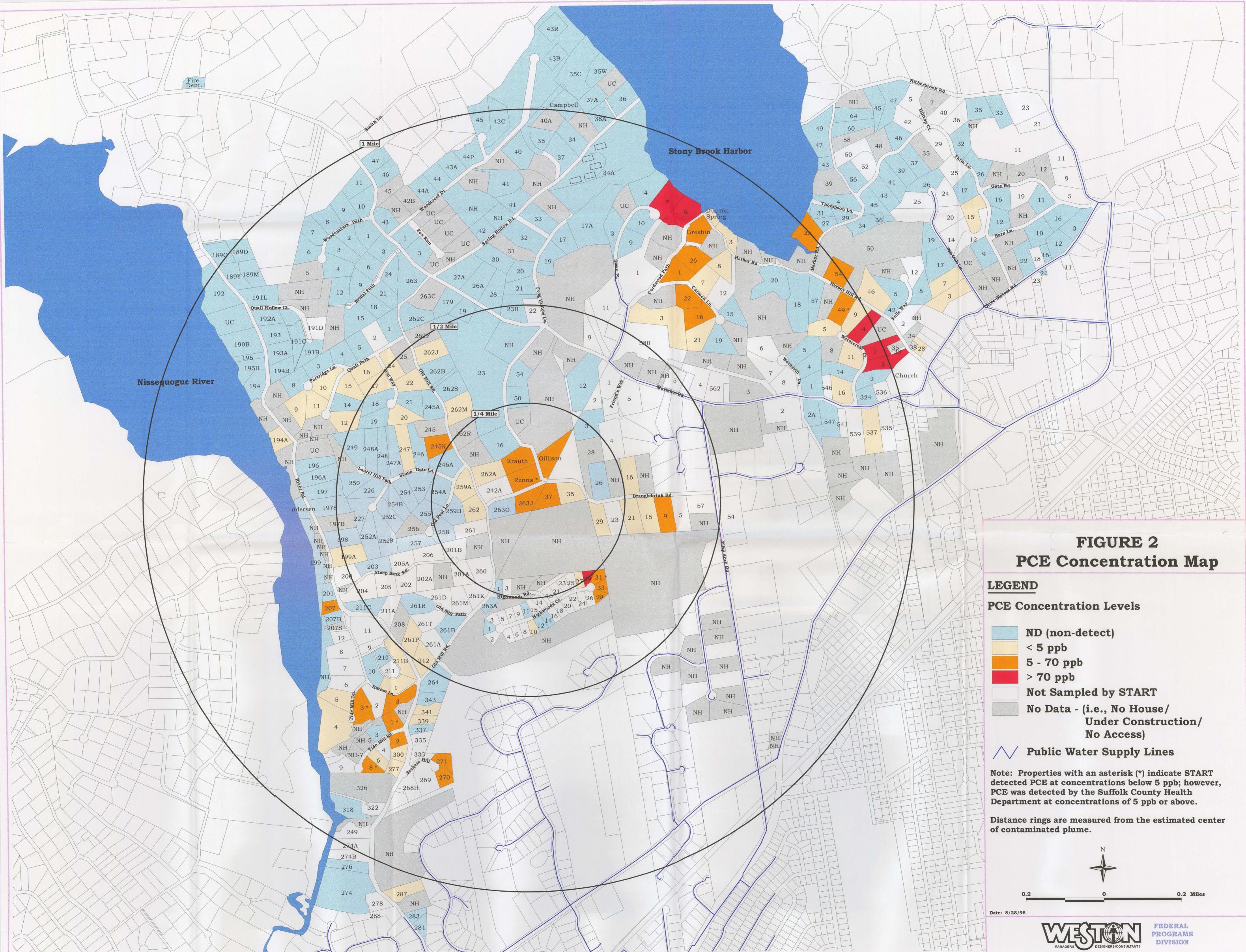
3.3.4 Wellhead Protection Area

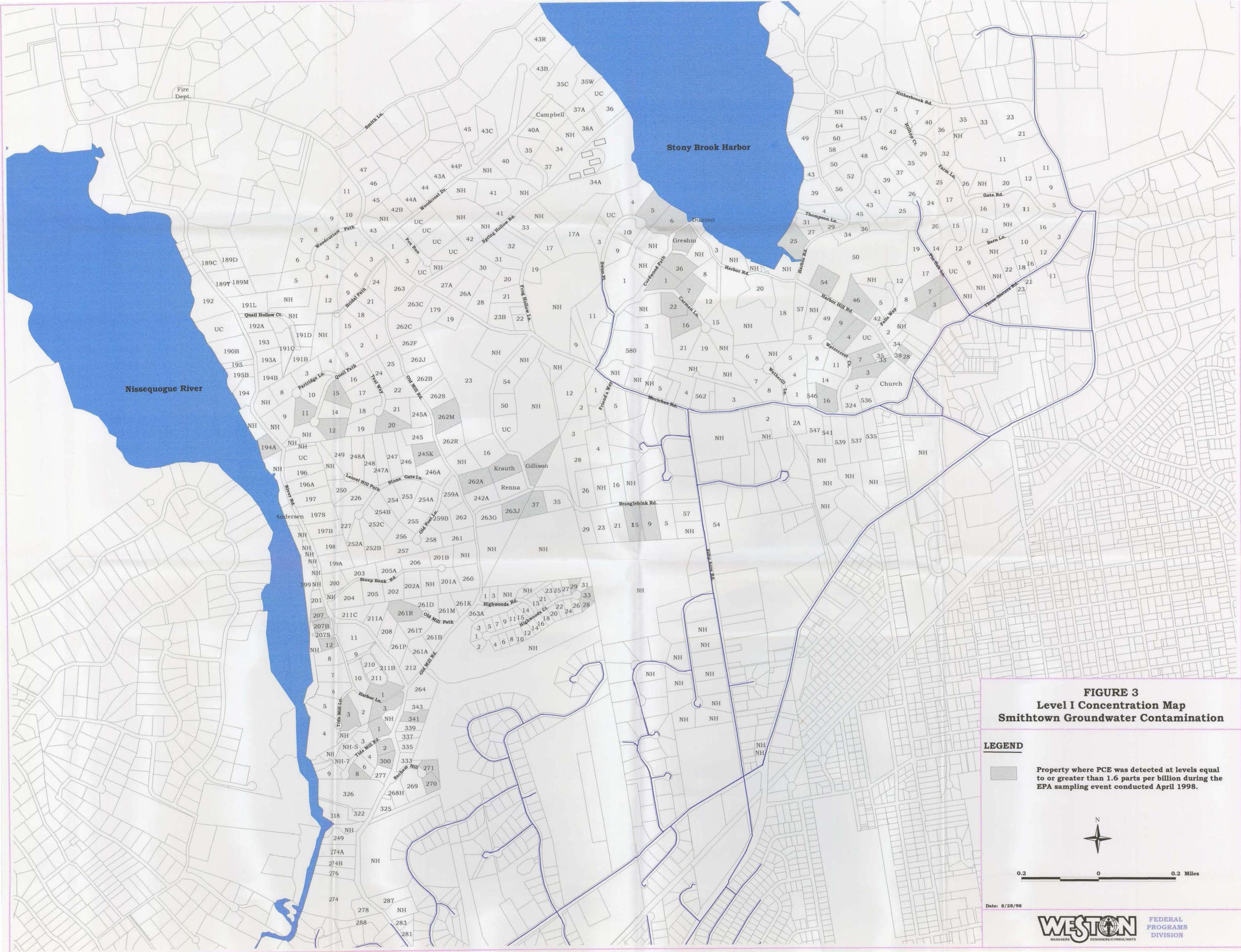
Wellhead protections Areas were not evaluated, as a maximum score for the ground water pathway was achieved by evaluating Level I populations.

SECTION IV: MAPS AND FIGURES



SECTION V: REFERENCES





REFERENCE NO. 1

12-14-90

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Postage and Fees Paid U.S. Government Printing Office (ISSN 0097-6326) -If the hazardous waste exhibits only the characteristic of toxicity (or only the characteristic of EP toxicity), include only the mass of constituents in the hazardous waste that are CERCLA hazardous substances and not the mass of the entire hazardous waste.

-If the hazardous waste exhibits any other characteristic identified under section 3001 (including any other characteristic plus the characteristic of toxicity (or the characteristic of EP toxicity]), include the mass of the entire hazardous waste.

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Based on this mass, designated as C. assign a value for hazardous constituent quantity as follows:

- · For the migration pathways, assign the source a value for hazardous constituent quantity using the Tier A equation of Table 2-5.
- · For the soil exposure pathway, assign the area of observed contamination a value using the Tier A equation of Table 5-2 (section 5.1.2.2).

If the hazardous constituent quantity for the source (or area of observed contamination) is adequately determined (that is, the total mass of all CERCLA hazardous substances in the source and releases from the source [or in the area of observed contamination] is known or is estimated with reasonable confidence), do not evaluate the other three measures discussed below. Instead assign these other three measures a value of 0 for the source (or area of observed contamination) and proceed to section 2.4.2.1.5.

If the hazardous constituent quantity is not adequately determined, assign the source (or area of observed contamination) a value for hazardous constituent quantity based on the available data and proceed to section 2.4.2.1.2.

TABLE 2-5.—HAZARDOUS WASTE **QUANTITY EVALUATION EQUATIONS**

Tier	Measure	Units	Equation for assigning value *
Α	Hazardous	lb	С
	constituent		1
	quantity (C)		1
Вь	Hazardous	lb	W/5.000
	wastestream		1
	quantity (W)		
C.	/olume (V)		ļ
	Landfill	yd ³	V/2,500
	Surface	yda	V/2.5
	impoundment	_	
	Surface	yd3	V/2.5
	impoundment		!
	(buried/backfilled)		
	Drums	gallon	V/500
	Tanks and	yd3	V/2.5
	containers other		1
	than drums		
	Contaminated soil	yd ³	V/2,500
	Pile	yd ³	V/2.5
ים	Other	yd ³	V/2.5
<i>U</i> •	Area (A)		4 (0 400
	Landfill	ft²	A/3,400
		ft=	A/13
٠.	impoundment	!	į

TABLE 2-5.—HAZARDOUS WASTE QUAN-TITY EVALUATION EQUATIONS—Concluded

Tier	Measure	Units	Equation for assigning value •
	Surface impoundment (buried/ backfilled)	Ħ²	A/13
	Land treatment Pile 4 Contaminated soil	Us Us Us	A/270 A/13 A/34,000

Do not round to nearest integer.

*Convert volume to mass when ton=2,000 pounds=1 cubic yard=4 drums=200 gallons.

"If actual volume of drums is unavailable, assume

1 drum=50 gallons.

4 Use land surface area under pile, not surface area of pile.

2.4.2.1.2 Hazardous wastestreum quantity. Evaluate hazardous wastestream quantity for the source (or area of observed contamination) based on the mass of hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants (as defined in CERCLA section 101[33], as amended) that are allocated to the source (or area of observed contamination). For a wastestream that consists solely of a hazardous waste listed pursuant to section 3001 of RCRA, as amended or that consists solely of a RCRA hazardous waste that exhibits the characteristics identified under section 3001 of RCRA, as amended, include the mass of that entire hazardous waste in the evaluation of this measure.

Based on this mass, designated as W. assign a value for hazardous wastestream quantity as follows:

- · For the migration pathways, assign the source a value for hazardous wastestream quantity using the Tier B equation of Table
- · For the soil exposure pathway, assign the area of observed contamination a value using the Tier B equation of Table 5-2 (section 5.1.2.21.

Do not evaluate the volume and area measures described below if the source is the unallocated source or if the following condition applies:

· The hazardous wastestream quantity for the source (or area of observed contamination) is adequately determinedthat is, total mass of all hazardous wastestreams and CERCLA pollutants and contaminants for the source and releases from the source (or for the area of observed contamination) is known or is estimated with reasonable confidence.

If the source is the unallocated source or if this condition applies, assign the volume and area measures a value of 0 for the source (or area of observed contamination) and proceed to section 2.4.2.1.5. Otherwise, assign the source (or area of observed contamination) a value for hazardous wastestream quantity based on the available data and proceed to section 2.4.2.1.3.

2.4.2.1.3 Volume. Evaluate the volume measure using the volume of the source (or the volume of the area of observed

contamination). For the soil exposure pathway, restrict the use of the volume measure to those areas of observed contamination specified in section 5.1.2.2.

Based on the volume, designated as V. assign a value to the volume measure as follows:

- · For the migration pathways, assign the source a value for volume using the appropriate Tier C equation of Table 2-5.
- · For the soil exposure pathway, assign the area of observed contamination a value for volume using the appropriate Tier C equation of Table 5-2 (section 5.1.2.2).

If the volume of the source (or volume of the area of observed contamination. if applicable) can be determined, do not evaluate the area measure. Instead, assign the area measure a value of 0 and proceed to section 2.4.2.1.5. If the volume cannot be determined (or is not applicable for the soil exposure pathway), assign the source (or area of observed contamination) a value of 0 for the volume measure and proceed to section 2.4.2.1.4.

2.4.2.1.4 Area. Evaluate the area measure using the area of the source (or the area of the area of observed contamination). Based on this area, designated as A, assign a value to the area measure as follows:

 For the migration pathways, assign the source a value for area using the appropriate Tier D equation of Table 2-5.

· For the soil exposure pathway, assign the area of observed contamination a value for area using the appropriate Tier D equation of Table 5-2 (section 5.1.2.2).

2.4.2.1.5 Calculation of source hazardous waste quantity value. Select the highest of the values assigned to the source (or area of observed contamination) for the hazardous constituent quantity, hazardous wastestream quantity, volume, and area measures. Assign this value as the source hazardous waste quantity value. Do not round to the nearest integer.

2.4.2.2 Calculation of hazardous waste quantity factor value. Sum the source hazardous waste quantity values assigned to all sources (including the unallocated source) or areas of observed contamination for the pathway being evaluated and round this sum to the nearest integer, except: if the sum is greater than 0, but less than 1, round it to 1. Based on this value, select a hazardous waste quantity factor value for the pathway from Table 2-6.

TABLE 2-6.—HAZARDOUS WASTE QUANTITY FACTOR VALUES

Hazardous waste quantity value	Assigned value
0	0 1 b 100 10,000 1,000,000

· If the hazardous waste quantity value is greater than 0, but less than 1, round it to 1 as specified in

For the pathway, if hazardous constituent quantity is not adequately determined, assign a value as specified in the text; do not assign the value of 1.

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For a migration pathway, if the hazardous constituent quantity is adequately determined (see section 2.4.2.1.1) for all sources (or all portions of sources and releases remaining after a removal action). ssign the value from Table 2-6 as the azardous waste quantity factor value for the pathway. If the hazardous constituent quantity is not adequately determined for one or more sources (or one or more portions of sources or releases remaining after a removal action) assign a factor value as follows:

If any target for that migration pathway
is subject to Level I or Level II concentrations
(see section 2.5), assign either the value from
Table 2-6 or a value of 100, whichever is
greater, as the hazardous waste quantity
factor value for that pathway.

 If none of the targets for that pathway is subject to Level I or Level II concentrations, assign a factor value as follows:

-If there has been no removal action, assign either the value from Table 2-6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value for that pathway.

-if there has been a removal action:

 Determine values from Table 2-6 with and without consideration of the removal action.

--If the value that would be assigned from Table 2-6 without consideration of the removal action would be 100 or greater, assign either the value from Table 2-6 with consideration of the removal action or a value of 100, whichever is greater, as the hazardous waste quantity factor value for the pathway.

--If the value that would be assigned from Table 2-6 without consideration of the removal action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the pathway.

For the soil exposure pathway, if the hazardous constituent quantity is adequately determined for all areas of observed contamination, assign the value from Table 2-6 as the hazardous waste quantity factor value. If the hazardous constituent quantity is not adequately determined for one or more areas of observed contamination, assign either the value from Table 2-6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value.

2.4.3 Waste characteristics factor category value. Determine the waste characteristics factor category value as specified in section 2.4.3.1 for all pathways and threats, except the surface water-human food chain threat and the surface water-environmental threat. Determine the waste characteristics factor category value for these latter two threats as specified in section 2.4.3.2.

2.4.3.1 Factor category value. For the pathway (or threat) being evaluated, multiply the loxicity or combined factor value, as appropriate, from section 2.4.1.2 and the hazardous waste quantity factor value from

ection 2.4.2.2, subject to a maximum product × 10°. Based on this waste characteristics factor duct assign a waste characteristics factor

category value to the pathway (or threat) from Table 2-7.

TABLE 2-7.—WASTE CHARACTERISTICS FACTOR CATEGORY VALUES

Waste characteristics product	Assigned value
0	
Greater than 0 to less than 10	
10 to less than 1×102	
1 × 102 to less than 1 × 103] 5
1×10 ³ to less than 1×10 ⁴] ;
1 x 104 to less than 1 x 103] 10
1×103 to less than 1×104	18
1 × 10°-to less than 1 × 107	
1×10° to less than 1×10°	- 32 - 56
1×10° to less than 1×10°	.,
1×10° to less than 1×1010	100 %
1×1010 to less than 1×1011	180
1×1011 to less than 1×1012	320
X1012	560
· / · · · · · · · · · · · · · · · · · ·	1,000

2.4.3.2 Factor category value, considering bioaccumulation potential. For the surface water-human food chain threat and the surface water-environmental threat, multiply the toxicity or combined factor value, as appropriate, from section 2.4.1.2 and the hazardous waste quantity factor value from section 2.4.2.2, subject to:

A maximum product of 1×10¹², and
 A maximum product exclusive of the bioaccumulation (or ecosystem bioaccumulation) potential factor of 1×10⁸.

Based on the total waste characteristics product, assign a waste characteristics factor category value to these threats from Table 2-7.

2.5 Targets.

The types of targets evaluated include the following:

 Individual (factor name varies by pathway and threat).

Human population.

 Resources (these vary by pathway and threat).

 Sensitive environments (included for all pathways except ground water migration).

The factor values that may be assigned to each type of target have the same range for each pathway for which that type of target is evaluated. The factor value for most types of targets depends on whether the target is subject to actual or potential contamination for the pathway and whether the actual contamination is Level I or Level II:

 Actual contamination: Target is associated either with a sampling location that meets the criteria for an observed release (or observed contamination) for the pathway or with an observed release based on direct observation for the pathway (additional criteria apply for establishing actual contamination for the human food chain threat in the surface water migration pathway, see sections 4.1.3.3 and 4.2.3.3). sections 3 through 6 specify how to determine the targets associated with a sampling location or with an observed release based on direct observation. Determine whether the actual contamination is Level I or Level II as follows:

-Level I:

 Media-specific concentrations for the target meet the criteria for an observed release (or observed contamination) for the pathway and are at or above media-specific benchmark values. These benchmark values (see section 2.5.2) include both screening concentrations and concentrations specified in regulatory limits (such as Maximum Contaminant Level (MCL) values), or

--For the human food chain threat in the surface water migration pathway, concentrations in tissue samples from aquatic human food chain organisms are at or above benchmark values. Such tissue samples may be used in addition to media-specific concentrations only as specified in sections 4.1.3.3 and 4.2.3.3.

-Level II:

--Media-specific concentrations for the target meet the criteria for an observed release (or observed contamination) for the pathway, but are less than media-specific benchmarks. If none of the hazardous substances eligible to be evaluated for the sampling location has an applicable benchmark, assign Level II to the actual contamination at the sampling location, or

 For observed releases based on direct observation, assign Level II to targets as specified in sections 3, 4, and 6, or

 For the human food chain threat in the surface water migration pathway, concentrations in tissue samples from aquatic human food chain organisms, when applicable, are below benchmark values.

-If a target is subject to both Level I and Level II concentrations for a pathway (or threat), evaluate the target using Level I concentrations for that pathway (or threat).

 Potential contamination: Target is subject to a potential release (that is, target is not associated with actual contamination for that pathway or threat).

Assign a factor value for individual risk as follows (select the highest value that applies to the pathway or threat):

 50 points if any individual is exposed to Level I concentrations.

 45 points if any individual is exposed to Leve! II concentrations.

 Maximum of 20 points if any individual is subject to potential contamination. The value assigned is 20 multiplied by the distance or dilution weight appropriate to the pathway.

Assign factor values for population and sensitive environments as follows:

Sum Level I targets and multiply by 10.
 (Level I is not used for sensitive environments in the soil exposure and air migration pathways.)

· Sum Level II targets.

 Multiply potential targets by distance or dilution weights appropriate to the pathway, sum, and divide by 10. Distance or dilution weighting accounts for diminishing exposure

TABLE 3-1.—GROUND WATER MIGRATION PATHWAY SCORESHEET

Factor categories and factors	Maximum Value	Value assigned
kelihood of Release to an Aquifer		
1. Chserved Ralease	550	1
2. Polential to Helease:		
2a. Containment	10	}
₹5. NET Precipitation	1 40	ļ
. 2C. Depth to Aquiter	1	
ZOL Travel Time	1	
29. Potential to Release Times 23(2b+Cc+2d)1	1 500	· —
o. Exempted of netward (higher of lines 1 and 26)	550 550	1 —
age Cuaracteristics:	i i	
4. Toxicity/Mobility.	1 (2)	1
o. a.	1 4-1	
6. Waste Characteristics	(2) 100	1 —
11 gata.		· -
7. Nearest Well	50	1
o. r opudion.	1	
8a. Level I Concentrations	200	1
os. Level ii Concentrazions	ذم ا	1 —
oc. Potential Contamination	1 65	Į —
co. Population (lines 88+80+80)	ا مُن	
J. NESOUICES	1 -	l —
IV. Welinead Protection Area	1 00	
11. Targe's (lines 7+8d+9+10)	20	1
Outer Mater Middistron Score for an Antister	,	-
12. Aquifer Score [(lines 3 x 6 x 11)/82,500] *	400]
ound water migration Pathway Score:	1 .	
13. Pathway Score (S _c .), (highest value from ine 12 for all acuriers evaluated)	100	_

Maximum value applies to waste characteristics category.

3.0.1 General considerations

3.0.1.1 Ground water target distance limit. The target distance limit defines the maximum distance from the sources at the site over which targets are evaluated. Use a target distance limit of 4 miles for the ground water migration pathway, except when aquifer discontinuities apply (see section 3.0.1.2.2). Furthermore, consider any well with an observed release from a source at the site (see section 3.1.1) to lie within the target distance limit of the site, regardless of the well's distance from the sources at the site.

For sites that consist solely of a contaminated ground water plume with no identifieo source, begin measuring the 4-mile target distance limit at the center of the area of observed ground water contamination. Determine the area of observed ground water contamination based on available samples that meet the criteria for an observed release.

3.0.1.2 Aquifer boundaries. Combine multiple aquifers into a single hydrologic unit for scoring purposes if aquifer interconnections can be established for these aquifers. In contrast, restrict aquifer boundaries if aquifer discontinuities can be established.

3.0.1.2.1 Aquifer interconnections. Evaluate whether aquifer interconnections occur within 2 miles of the sources at the site. If they occur within this 2-mile distance, combine the aquifers having interconnections in scoring the site. In addition, if observed ground water contamination attributable to the sources at the site extends beyond 2 miles from the sources, use any locations within the limits of this observed ground water contamination in evaluating aquifer interconnections. If data are not adequate to establish aquifer interconnections, evaluate the aquifers as separate aquifers.

3.0.1.2.2 Aquifer discontinuities. Evaluate whether aquifer discontinuities occur within the 4-mile target distance limit. An aquifer discontinuity occurs for scoring purposes only when a geologic, topographic, or other structure or feature entirely transects an aquifer within the 4-mile target distance limit, thereby creating a continuous boundary to ground water flow within this limit. If two or more aquifers can be combined into a single hydrologic unit for scoring purposes, an aquifer discontinuity occurs only when the structure or feature entirely transects the boundaries of this single hydrologic unit.

When an aquifer discontinuity is established within the 4-mile target distance limit, exclude that portion of the aquifer beyond the discontinuity in evaluating the ground water migration pathway. However, if hazardous substances have migrated across an apparent discontinuity within the 4-mile target distance limit, do not consider this to be a discontinuity in scoring the site.

3.0.1.3 Karst aquifer. Give a karst aquifer that underlies any portion of the sources at the site special consideration in the evaluation of two potential to release factors (depth to aquifer in section 3.1.2.3 and travel time in section 3.1.2.4), one waste characteristics factor (mobility in section 3.2.1.2), and two targets factors (nearest well in section 3.3.1 and potential contamination in section 3.3.2.4).

3.1 Likelihood of release. For an aquifer, evaluate the likelihood of release factor category in terms of an observed release factor or a potential to release factor.

3.1.1 Observed release. Establish an observed release to an aquifer by demonstrating that the site has released a hazardous substance to the aquifer. Base this demonstration on either:

 Direct observation—a material that contains one or more hazardous substances has been deposited into or has been observed entering the aquifer.

 Chemical analysis—an analysis of ground water samples from the aquifer indicates that the concentration of hazardous substance(s) has increased significantly above the background concentration for the site (see section 2.3). Some portion of the significant increase must be attributable to the site to establish the observed release, except: when the source itself consists of a ground water plume with no identified source, no separate attribution is required.

If an observed release can be established for the aquifer, assign the aquifer an observed release factor value of 550, enter this value in Table 3–1, and proceed to section 3.1.3. If an observed release cannot be established for the aquifer, assign an observed release factor value of 0, enter this value in Table 3–1, and proceed to section 3.1.2.

3.1.2 Potential to release. Evaluate potential to release only if an observed release cannot be established for the aquifer. Evaluate potential to release based on four factors: containment, net precipitation, depth to aquifer, and travel time. For sources overlying karst terrain, give any karst aquifer that underlies any portion of the sources at the site special consideration in evaluating depth to aquifer and travel time, as specified in sections 3.1.2.3 and 3.1.2.4.

3.1.2.1 Containment. Assign a containment factor value from Table 3-2 to each source at the site. Select the highest containment factor value assigned to those sources with a source hazardous waste quantity value of 0.5 or more (see section

Maximum value not applicable.
 Do not round to nearest integer.

2.4.2.1.5). (Do not include this minimum size requirement in evaluating any other factor of this pathway.) Assign this highest value as the containment factor value for the aquifer being evaluated. Enter this value in Table 3-1.

If no source at the site meets the minimum size requirement, then select the highest value assigned to the sources at the site and

assign it as the containment factor value for the aquifer being evaluated. Enter this value in Table 3–1.

3.1.2.2 Net precipitation. Assign a net precipitation factor value to the site. Figure 3-2 provides computed net precipitation factor values, based on site location. Where necessary, determine the net precipitation factor value as follows:

 Determine monthly precipitation and monthly evapotranspiration:

-Use local measured monthly averages.
 -When local data are not available, use monthly averages from the nearest National Oceanographic and Atmospheric Administration weather station that is in a similar geographic setting.

TABLE 3-2.—CONTAINMENT FACTOR VALUES FOR GROUND WATER MIGRATION PATHWAY

Source	Assigned value
All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks)	
vidence of hazardous substance migration from source area (i.e., source area includes source and any	10
associated containment structures).	10
No evidence of hazardous substance migration from source area, a liner, and: (a) None of the following present: (1) maintained engineered cover, or (2) functioning and maintained run-on control system and runoff management system, or (3) functioning leachate collection and removal system immediately above liner. 	10
(b) Any one of the three items in (a) present	9 -
(c) Any two of the items in (a) present	7
(d) All three items in (a) present plus a functioning ground water monitoring system	5
(e) All items in (d) present plus a full-titlining ground mater inclinding dysterms in (d) present, plus no bulk or non-containerized liquids nor materials containing free liquids deposited in source area.	3
No evidence of hazardous substance migration from source area, double liner with functioning leachate collection and removal system above and between liners, functioning ground water monitoring system, and:	
(f) Only one of the following deficiencies present in containment: (1) bulk or noncontainerized liquids or materials containing free liquids deposited in source area, or (2) no or nonfunctioning or nonmaintained run- on control system and runoff management system, or (3) no or nonmaintained engineered cover.	3
(a) None of the deficiencies in (f) present	0
Source area inside or under maintained intact structure that provides protection from precipitation so that neither runoff nor leachate is generated, liquids or materials containing free liquids not deposited in source area, and functioning and maintained run-on control present.	0
Surface Impoundment	
Evidence of hazardous substance migration from surface impoundment	10
No liner	
Free liquids present with either no diking, unsound diking, or diking that is not regularly inspected and maintained No evidence of hazardous substance migration from surface impoundment, free liquids present, sound diking that is regularly inspected and maintained, adequate freeboard, and:	10
(a) Liner	9
(b) Liner with functioning leachate collection and removal system below liner, and functioning ground water monitoring system.	5
(c) Double liner with functioning leachate collection and removal system between liners, and functioning ground water monitoring system.	3
No evidence of hazardous substance migration from surface impoundment and all free liquids eliminated at closure (either by removal of liquids or solidification of remaining wastes and waste residues).	Evaluate using All sources criteria (with no pull or free liquid deposited).
Land Treatment	
Evidence of hazardous substance migration from land treatment zone	. 10
No functioning, maintained, run-on control and runoff management system	
No evidence of hazardous substance migration from land treatment zone <i>and</i> : (a) Functioning and maintained run-on control and runoff management system	
(b) Functioning and maintained run-on control and runoff management system, and vegetative cover established over entire land treatment area.	5
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TABLE 3-6.—HYDRAULIC CONDUCTIVITY OF GEOLOGIC MATERIALS

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TABLE 3-6.—HYDRAULIC CONDUCTIVITY OF GEOLOGIC MA	TERIALS	;		-010
Type of material Clay: low permeability (#2.40000)			- 1	Assigned hydraulic conductivity (CRL/sec)
Clay; low permeability III (compact untractured till); shale; unfractured metamorphic and igneous rocks. Sit; loesses; sity clays; sediments that are predominantly sits; moderately permeable III (fine-grained, unconso metamorphic rocks	ivated till. Ar	COMPAND N	l with	10-1
poar, moderately permeable limestones and dolomites (no leastly moderately permeable limestones).	compact and	highly fract		10-4
groods and metamorphic focks; permeable basely kneet Emperature	and dolomite:	3	HOURS .	10 ⁻⁴ 10 ⁻⁸
* Do not round to nearest integer. TABLE 3-7.—TRAVEL TIME FACTOR VALUES *				
. Hydraulic conductivity (cm/sec)	Thickne	ss of lowest layer(s	hydraulic c	onductivity
	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Greater than or equal to 10 ⁻³ . Less than 10 ⁻³ to 10 ⁻³ . Less than 10 ⁻³ to 10 ⁻⁷ . Less than 10 ⁻⁷	35 35 15	35 25 15	25 15 5	25 15

TABLE 3-7.—TRAVEL TIME FACTOR VALUES *

Hydraulic conductivity (cm/sec)	Thickness of lowest bydraulic conductivity layer(s)* (feet)			
Greater than or equal to 10-3	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Less than 10° to 10° Less than 10° Le	35 35 15 5	35 25 15 5	25 15 \$) 1.	25 15 5 1

eet or less or if, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of

b Consider only layers at least 3 feet thick. Do not consider layers or portions of layers within the first 10 feet of the depth to the aquiller.

Determine travel time only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the travel time factor for any aquifer that does not have an observed release. If the necessary subsurface geologic Information is available at multiple locations, evaluate the travel time factor at each location. Use the location having the highest travel time factor value to assign the factor value for the aquifer. Enter this value in Table 3-1.

3.1.2.5 Calculation of potential to release factor value. Sum the factor values for net precipitation, depth to aquifer, and travel time, and multiply this sum by the factor value for containment. Assign this product as . the potential to release factor value for the aquifer. Enter this value in Table 3-1.

3.1.3 Calculation of likelihood of release factor category value. If an observed release is established for an aquifer, assign the observed release factor value of 550 as the

likelihood of release factor category value for that aquifer. Otherwise, assign the potential to release factor value for that aquifer as the likelihood of release value. Enter the value assigned in Table 3-1.

3.2 Waste characteristics. Evaluate the waste characteristics factor category for an aquifer based on two factors: toxicity/ mobility and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to ground water. Such hazardous substances include:

 Hazardous substances that meet that criteria for an observed release to ground

 All hazardous substances associated with a source that has a ground water containment factor value greater than 0 (see sections 2.2.2, 2.2.3, and 3.1.2.1).

3.2.1 Toxicity/mobility. For each hazardous substance, assign a toxicity factor value, a mobility factor value, and a combined toxicity/mobility factor value es specified in the following sections. Select the toxicity/mobility factor value for the aquifer being evaluated as specified in section 3.2.1.3.

3.2.1.1 Toxicity. Assign a toxicity factor value to each hazardous substance as specified in Section 2.4.1.1.

3.2.1.2 Mobility. Assign a mobility factor value to each hazardous substance for the aquifer being evaluated as follows:

 For any hazardous substance that meets the criteria for an observed release by chemical analysis to one or more aquifers underlying the sources at the site, regardless of the aquifer being evaluated, assign a mobility factor value of 1.

 For any hazardous substance that does not meet the criteria for an observed release by chemical analysis to at least one of the aquifers, assign that hazardous substance a mobility factor value from Table 3-8 for the aquifer being evaluated, based on its water solubility and distribution coefficient (Kd).

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 If the hazardous substance cannot be assigned a mobility factor value because data on its water solubility or distribution coefficient are not available, use other hazardous substances for which information is available in evaluating the pathway.

TABLE 3-8.—GROUND WATER MOBILITY FACTOR VALUES *

- 1 - -	THE TOTAL VALUES	•			
	Water solubility (mg/l)	Dist	ribution coe	fficient (K _d) (/	ni/g)
Pre	Sent as liquid	Karst 4	≤ 10	>10 to 1,000	>1,000
Gre Gre	ater than 100. ater than 1 to 100 ater than 0.01 to 1 s than or equal to 0.01 **Do not round to marrest integer. **Use if the hazardous automates.**	1 1 0.2 0.002 2x10-1	1 1 0.2 0.002 2x10 ⁻³	0.01 0.01 0.002 2x10 ⁻³ 2x10 ⁻⁷	0.0001 0.0001 2x10-3 2x10-7 2x10-7

Use if the hazardous substance is present or deposited as a liquid. Use if the entire interval from the source to the aquifer being evaluated is karst.

· If none of the hazardous substances eligible to be evaluated can be assigned a mobility factor value, use a default value of 0.002 as the mobility factor value for all these hazardous substances.

Determine the water solubility to be used in Table 3-8 for the hazardous substance as follows (use this same water solubility for all

aquifers):

 For any hazardous substance that does not meet the criteria for an observed release by chemical analysis, if the hazardous substance is present or deposited as a liquid, use the water solubility category "Present as Liquid" in Table 3-8 to assign the mobility factor value to that hazardous substance.

Otherwise:

-For any hazardous substance that is a metal (or metalloid) and that does not meet the criteria for an observed release by chemical analysis, establish a water solubility for the hazardous substance as follows:

- Determine the overall range of water solubilities for compounds of this hazardous substance (consider all compounds for which adequate water solubility information is available, not just compounds

identified as present at the site). Calculate the geometric mean of the highest and the lowest water solubility in this range.

-- Use this geometric mean as the water solubility in assigning the hazardous substance a mobility factor value from Table 3–8.

-For any other hazardous substance (either organic or inorganic) that does not meet the criteria for an observed

release by chemical analysis, use the water solubility of that hazardous substance to assign a mobility factor value from Table 3-8 to the hazardous

For the aquifer being evaluated, determine the distribution coefficient to be used in Table 3-8 for the hazardous substance as follows:

- · For any hazardous substance that does not meet the criteria for an observed release by chemical analysis, if the entire interval from a source at the site to the aquifer being evaluated is karst, use the distribution coefficient category "Karst" in Table 3–8 in assigning the mobility factor value for that hazardous substance for that aquifer.
 - Otherwise:
 - -For any hazardous substance that is a metal (or metalloid) and that does not meet the criteria for an observed release by chemical analysis, use the distribution coefficient for the metal or (metalloid) to assign a mobility factor value from Table 3-8 for that hazardous substance.
 - For any other inorganic hazardous substance that does not meet the criteria for an observed release by chemical analysis, use the distribution coefficient for that inorganic hazardous substance, if available, to assign a mobility factor value from Table 3-8. If the distribution coefficient is not available, use a default value of "less than 10" as the distribution coefficient, except: for asbestos use a default value of "greater than 1,000" as the distribution coefficient.

-For any hazardous substance that is organic and that does not meet the criteria for an observed release by chemical analysis, establish a distribution coefficient for that hazardous substance as follows:

- Estimate the K_d range for the hazardous substance using the following equation:

 $K_d = (K_{oc})(f_s)$

where:

Koc=Soil-water partition coefficient for organic carbon for the hazardous substance.

f. = Sorbent content (fraction of clays plus organic carbon) in the subsurface.

-- Use f, values of 0.03 and 0.77 in the above equation to establish the upper and lower values of the Ka range for the hazardous substance.

-Calculate the geometric mean of the upper and lower Kd range values. Use this geométric mean as the distribution coefficient in assigning the hazardous substance a mobility factor value from Table 3-8.

3.2.1.3 Calculation of toxicity/mobility factor value. Assign each hazardous substance a toxicity/mobility factor value from Table 3-9, based on the values assigned to the hazardous substance for the toxicity and mobility factors. Use the hazardous substance with the highest toxicity/mobility factor value for the aquifer being evaluated to assign the value to the toxicity/mobility factor for that aquifer. Enter this value in Table 3-1.

TABLE 3-9.—TOXICITY/MOBILITY FACTOR VALUES *

	Toxicity factor value									
Mobility factor value	10,000 1,000		100	10	. 1	0				
1.0 0.2 0.01 0.002 0.0001 2x10-* 2x10-7 2x10-7	10,000 2,000 100 20 1 0.2 0.002 2x10 ⁻⁴	1,000 200 10 2 0.1 0.02 2x10 ⁻⁴ 2x10 ⁻⁶	100 20 1 0.2 0.01 0.002 2x10 ⁻⁵ 2x10 ⁻⁷	10 2 0.1 0.02 0.001 2x10 ⁻⁴ 2x10 ⁻⁶ 2x10 ⁻⁶	1 0.2 0.01 0.002 1x10-4 2x10-7 2x10-7	0 0 0 0 0 0				

* Do not round to nearest integer.

3.2.2 Hazardous waste quantity. Assign a hazardous waste quantity factor value for the ground water pathway (or aquifer) as specified in section 2.4.2. Enter this value in Table 3-1.

3.2.3 Calculation of waste characteristics factor category value. Multiply the toxicity/ mobility and hazardous waste quantity factor values, subject to a maximum product of 1×10. Based on this product, assign a value from Table 2-7 (section 2.4.3.1) to the waste characteristics factor category. Enter this value in Table 3-1.

3.3 Targets. Evaluate the targets factor category for an aquifer based on four factors: nearest well, population, resources, and Wellhead Protection Area. Evaluate these four factors based on targets within the target distance limit specified in section 3.0.1.1 and the aquifer boundaries specified in section 3.0.1.2. Determine the targets to be included in evaluating these factors for an aquifer as specified in section 3.0.

3.3.1 Nearest well. In evaluating the nearest well factor, include both the drinking water wells drawing from the aquifer being evaluated and those drawing from overlying aquifers as specified in section 3.0. Include standby wells in evaluating this factor only if

they are used for drinking water supply at least once every year.

If there is an observed release by direct observation for a drinking water well within the target distance limit, assign Level II concentrations to that well. However, if one or more samples meet the criteria for an observed release for that well, determine if that well is subject to Level I or Level II concentrations as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 3-10 in determining the level of contamination.

Assign a value for the nearest well factor as follows:

 If one or more drinking water wells is subject to Level I concentrations, assign a value of 50.

 If not, but if one or more drinking water wells is subject to Level II concentrations, assign a value of 45.

 If none of the drinking water wells is subject to Level I or Level II concentrations, assign a value as follows:

-If one of the target aquifers is a karst aquifer that underlies any portion of the sources at the site and any well draws drinking water from this karst aquifer within the target distance limit, assign a value of 20.

-If not, determine the shortest distance to any drinking water well, as measured from any source at the site with a ground water containment factor value greater than 0. Select a value from Table 3-11 based on this distance. Assign it as the value for the nearest well factor.

Enter the value assigned to the nearest well factor in Table 3-1.

TABLE 3-10.—HEALTH-BASED BENCH-MARKS FOR HAZARDOUS SUBSTANCES IN DRINKING WATER

- Concentration corresponding to Maximum Contaminant Level (MCL).
- Concentration corresponding to a nonzero Maximum Contaminant Level Goal (MCLG).
- Screening concentration for cancer corresponding to that concentration that corresponds to the 10⁻⁶ individual cancer risk for oral exposures.
- Screening concentration for noncancer toxicological responses corresponding to the Reference Dose (RfD) for oral exposures.

TABLE 3-11.—NEAREST WELL FACTOR VALUES

Distance from source (miles)	Assigned value
Level I concentrations ^a Lavel II concentrations ^a 0 to ¼ Greater than ¼ to ½ Greater than ½ to 1 Greater than 1 to 2 Greater than 2 to 3 Greater than 3 to 4	9

Distance does not apply.

3.3.2 Population. In evaluating the population factor, include those persons served by drinking water wells within the target distance limit specified in section 3.0.1.1. For the aquifer being evaluated, count those persons served by wells in that aquifer and those persons served by wells in overlying aquifers as specified in section 3.0. Include residents, students, and workers who

regularly use the water. Exclude transient populations such as customers and travelers passing through the area. Evaluate the population based on the location of the water supply wells, not on the location of residences, work places, etc. When a standby well is maintained on a regular basis so that water can be withdrawn, include it in evaluating the population factor.

In estimating residential population, when the estimate is based on the number of residences, multiply each residence by the average number of persons per residence for the county in which the residence is located:

In determining the population served by a well, if the water from the well is blended with other water (for example, water from other ground water wells or surface water intakes), apportion the total population regularly served by the blended system to the well based on the well's relative contribution to the total blended system. In estimating the well's relative contribution, assume each well and intake contributes equally and apportion the population accordingly, except: if the relative contribution of any one well or intake exceeds 40 percent based on average annual pumpage or capacity, estimate the relative contribution of the wells and intakes considering the following data, if available:

 Average annual pumpage from the ground water wells and surface water intakes in the blended system.

 Capacities of the wells and intakes in the blended system.

For systems with standby ground water wells or standby surface water intakes, apportion the total population regularly served by the blended system as described above, except:

 Exclude standby surface water intakes in apportioning the population.

 When using pumpage data for a standby ground water well, use average pumpage for the period during which the standby well is used rather than average annual pumpage.

 For that portion of the total population that could be apportioned to a standby ground water well, assign that portion of the population either to that standby well or to the other ground water well(s) and surface water intake(s) that serve that population; do not assign that portion of the population both to the standby well and to the other well(s) and intake(s) in the blended system. Use the apportioning that results in the highest population factor value. (Either include all standby well(s) or exclude some or all of the standby well(s) as appropriate to obtain this highest value.) Note that the specific standby well(s) included or excluded and, thus, the specific apportioning may vary in evaluating different aquifers and in evaluating the surface water pathway.

3.3.2.1 Level of contamination. Evaluate the population served by water from a point of withdrawal based on the level of

contamination for that point of withdrawal. Use the applicable factor: Level I concentrations, Level II concentrations, or potential contamination.

If no samples meet the criteria for an observed release for a point of withdrawal and there is no observed release by direct observation for that point of withdrawal, evaluate that point of withdrawal using the potential contamination factor in section 3.3.2.4. If there is an observed release by direct observation, use Level II concentrations for that point of withdrawal. However, if one or more samples meet the criteria for an observed release for the point of withdrawal, determine which factor (Level I or Level II concentrations) applies to that point of withdrawal as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 3-10 in determining the level of contamination. Evaluate the point of withdrawal using the Level I concentrations factor in section 3.3.2.2 or the Level II concentrations factor in section 3.3.2.3, as appropriate.

For the potential contamination factor, use population ranges in evaluating the factor as specified in section 3.3.2.4. For the Level I and Level II concentrations factors, use the population estimate, not population ranges, in evaluating both factors.

3.3.2.2 Level I concentrations. Sum the number of people served by drinking water from points of withdrawal subject to Level I concentrations. Multiply this sum by 10. Assign this product as the value for this factor. Enter this value in Table 3–1.

3.3.2.3 Level II concentrations. Sum the number of people served by drinking water from points of withdrawal subject to Level II concentrations. Do not include those people already counted under the Level I concentrations factor. Assign this sum as the value for this factor. Enter this value in Table 3.1

3.3.2.4 Potential contamination.

Determine the number of people served by drinking water from points of withdrawal subject to potential contamination. Do not include those people already counted under the Level I and Level II concentrations factors.

Assign distance-weighted population values from Table 3–12 to this population as follows:

- Use the "Karst" portion of Table 3-12 to assign values only for that portion of the population served by points of withdrawal that draw drinking water from a karst aquifer that underlies any portion of the sources at the site.
 - -For this portion of the population, determine the number of people included within each "Karst" distance category in Table 3-12.

TABLE 3-12.—DISTANCE-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FACTOR FOR GROUND WATER MIGRATION PATHWAY.

	Number of people within the distance category												
Distance category (miles)	0	1 910	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	a 100,2 000,01	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,001 to 3,000,000
Other Than Karst : O to 1/4 Greater than 1/4 to 1/5 Greater than 1/4 to 1 Greater than 1 to 2 Greater than 2 to 3 Greater than 3 to 4	0	4 2 1 0.7 0.5 0.3	17 11 5 3 2	53 33 17 10 7	164 102 52 30 21	522 324 167 94 68 42	1,633 1,013 523 234 131	5,214 3,233 1,669 939 678 417	16,325 10,122 5,224 2,939 2,122 1,306	52,137 32,325 16,684 9,385 6,778 4,171	163,246 101,213 52,239 29,384 21,222 13,060	521,360 323,243 166,835 93,845 67,777 41,709	1,632,455 1,012,122 522,385 293,842 212,219 130,596
Karst *: 0 to 1/4	00000	4 2 2 2 2 2 2	17 11 9 9 9	53. 33 26 28 26 26 26	164 102 82 82 82 82 82	522 324 261 261 261 261	1,633 1,013 817 817 817 817	5.214 3.233 2.607 2.607 2.607 2.607	16,325 10,122 8,163 8,163 8,163 8,163	52,137 32,325 26,068 26,068 26,068 26,068	163,246 101,213 81,623 81,623 81,623 81,623	521,380 323,243 260,880 260,680 260,680 260,680	1,632,455 1,012,122 818,227 818,227 816,227 816,227

^{*}Round the number of people present within a distance category to nearest integer. Do not round the assigned distance-weighted population value to nearest integer,

or use for all aquifers, except karst aquifers underlying any portion of the sources at the site.

Use only for karst aquifers underlying any portion of the sources at the site.

 Assign a distance-weighted population value for each distance category based on the number of people included within the distance category.

 Use the "Other Than Karst" portion of Table 3-12 for the remainder of the population served by points of withdrawal subject to potential contamination.

-For this portion of the population, determine the number of people included within each "Other Than Karst" distance category in Table 3-12.

-Assign a distance-weighted population value for each distance category based on the number of people included within the distance category.

Calculate the value for the potential contamination factor (PC) as follows:

$$PC = \frac{1}{10} \sum_{i=1}^{n} [W_i + K_i]$$

where:

W₁=Distance-weighted population from "Other Than Karst" portion of Table 3–12 for distance category i.

K_i=Distance-weighted population from "Karst" portion of Table 3-12 for distance category i.

n=Number of distance categories.

If PC is less than 1, do not round it to the nearest integer, if PC is 1 or more, round to the nearest integer. Enter this value in Table 3-1.

3.3.2.5 Calculation of population factor value. Sum the factor values for Level I concentrations, Level II concentrations, and potential contamination. Do not round this sum to the nearest integer. Assign this sum as the population factor value for the aquifer. Enter this value in Table 3-1.

3.3.3 Resources. To evaluate the esources factor, select the highest value ecified below that applies for the aquifer eing evaluated. Assign this value as the

resources factor value for the aquifer. Enter this value in Table 3-1.

Assign a resources value of 5 if water drawn from any target well for the aquifer being evaluated or overlying aquifers (as specified in section 3.0) is used for one or more of the following purposes:

 Irrigation (5-acre minimum) of commercial food crops or commercial forage crops.

Watering of commercial livestock.

Ingredient in commercial food preparation.

· Supply for commercial aquaculture.

 Supply for a major or designated water recreation area, excluding drinking water use.

Assign a resources value of 5 if no drinking water wells are within the target distance limit, but the water in the aquifer being evaluated or any overlying aquifers (as specified in section 3.0) is usable for drinking water purposes.

Assign a resources value of 0 if none of the above applies.

3.3.4 Wellhead Protection Area. Evaluate the Wellhead Protection Area factor based on Wellhead Protection Areas designated according to section 1428 of the Safe Drinking Water Act, as amended. Consider only those Wellhead Protection Areas applicable to the aquifer being evaluated or overlying aquifers (as specified in section 3.0). Select the highest value below that applies. Assign it as the value for the Wellhead Protection Area factor for the aquifer being evaluated. Enter this value in Table 3–1.

Assign a value of 20 if either of the following criteria applies for the aquifer being evaluated or overlying aquifers:

 A source with a ground water containment factor value greater than 0 lies. either partially or fully, within or above the designated Wellhead Protection Area.

 Observed ground water contamination attributable to the sources at the site lies, either partially or fully, within the designated Wellhead Protection Area. If neither criterion applies, assign a value of 5, if, within the target distance limit, there is a designated Wellhead Protection Area applicable to the aquifer being evaluated or overlying aquifers.

Assign a value of 0 if none of the above applies.

3.3.5 Calculation of targets factor category value. Sum the factor values for nearest well, population, resources, and Wellhead Protection Area. Do not round this sum to the nearest integer. Use this sum as the targets factor category value for the aquifer. Enter this value in Table 3-1.

3.4 Ground water migration score for an aquifer. For the aquifer being evaluated, multiply the factor category values for likelihood of release, waste characteristics, and targets, and round the product to the nearest integer. Then divide by 82,500. Assign the resulting value, subject to a maximum value of 100, as the ground water migration pathway score for the aquifer. Enter this score in Table 3-1.

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3.5 Calculation of ground water migration pathway score. Calculate a ground water migration score for each aquifer underlying the sources at the site, as appropriate. Assign the highest ground water migration score for an aquifer as the ground water migration pathway score (S_{rw}) for the site. Enter this score in Table 3-1.

4.0 Surface Water Migration Pathway.

4.0.1 Migration components. Evaluate the surface water migration pathway based on two migration components:

 Overland/flood migration to surface water (see section 4.1).

 Ground water to surface water migration (see section 4.2).

Evaluate each component based on the same three threats: drinking water threat, human food chain threat, and environmental threat.

Score one or both components, considering their relative importance. If only one component is scored, assign its score as the surface water migration pathway score. If

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REFERENCE NO. 2

SUPERFUND CHEMICAL DATA MATRIX APPENDIX B TABLES

Page 8-18 SCDM Data Version: JUN96 18 FEB 97

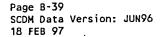
HAZARD RANKING SYSTEM Hazardous Substance Factor Values 376 Substances

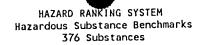
Bioaccumulation

Ground Water Mobility Environmental Ecotoxicity Food Chain Non-Liquid Persistence Liquid Air Gas Air Gas Migration Mobility Gas Part Salt Fresh Salt Fresh Fresh Salt Non-Karst Karst Non-Karst River Lake CAS Number Toxicity Karst Substance Name 10000 No Yes 10000 1.0E+00° 2.0E-05 2.0E-05* 1.0000 50.0 50.0 50.0 50.0 1.0000 100 1.0E+00 007440-22-4 Silver No Yes 500.0 500.0 1.0000 1,0000 500.0 500.0 2.0E-05 2.0E-05* 1.0E+00 1.0E+00* 10 000506-64-9 Silver Cyanide No Yes 0.5 0.5 1.0000 1.0000 0.5 ... 1.0E-02 1.0E+00 1.0E-02 1.0E+00 007440-23-5 Sodjum NA No Yes 1.0000 1.0000 0.5 0.5 0.5 1.0E-02° 1.0E+00° 1.0E-02° 0.5 . . . 1.0E+00 007440-24-6 Strontium NA No Yes 1000 1000 MΔ 5.0 5.0 5.0 1.0E+00 1.0E+00 1.0000* 1.0000* 5.0 10000 1.0E+00 1.0E+00 000057-24-9 Strychnine 100 17 1.0000 Yes No 50.0 100 50.0 50.0 50.0 1.0E+00° 1.0E+00 1.0E+00* 0.4000 1.0000 10 1.0E+00 000100-42-5 Styrene 10 11 0.0200 Yes Yes 0.5 0.5 0.5 10 0.5 0.4000 0.0700 1000 1.0E+00 1.DE+00 007664-93-9 Sulfuric acid 0.0020 Yes Yes 500.0 500.0 0.4000 0.0700 500.0 500.0 ... 2.0E-01* 2.0E-03* 1.0E-02 1.0E+00 000093-80-1 TB, 2,4,5-5000.0 10000 10000 6 0.0002 Yes Yes 5000.0 1.0000 1.0000 5000.0 5000.0 1.0E+00 1.0E-04 2.0E-05 2.0E-09 10000 001746-01-6 TCDD 17 0.2000 5000.0 100 1000 Yes Yes 5000.0 5000.0 5000.0 1.0000 1.0000 1.0E-02° 2.0E-03 2.0E-05* 10000 1.0E+00 000095-94-3 Tetrachlorobenzene, 1,2,4,5-WΔ No Yes NA 50000.0* 50000.0* 1.0000* 1.0000* 50000.0* 50000.0* 2.0E-03* 2.0E-07* . . . 10000* 1.0E+00 051207-31-9 Tetrachlorodibenzofuran, 2,3,7,8-1.0000 10 17 Yes 50.0 50.0 50.0 10 1.0E+00* 1.0E+00 1.0E+00* 0.4000 1.0000* 50.0 1.0E+00 100 000630-20-6 Tetrachloroethane, 1,1,1,2-11 1.0000 Yes 10 5.0 100 5.0 5.0 1.0E+00* 1.0E+00 1.0E+00* 0.4000 1.0000 5.0 10 1.0E+00 000079-34-5 Tetrachloroethane, 1,1,2,2-10 17 1.0000 Yes 50.0 50.0 100 50.0 1.0E+00* 1.0E+00 1.0E+00* 0.4000 1.0000 50.0 100 1.0E+00 000127-18-4 Tetrachloroethylene 1000 100 11 0.2000 Yes Yes 5000.0 5000.0 500.0 1.0E+00* 2.0E-01* 2.0E-01* 1.0000 0.4000* 500.0 100 000058-90-2 Tetrachlorophenol, 2,3,4,6-17 1.0000 Yes No 10000 500.0 100 500.0 500.0 500.0 0.0700 0.0700 2.0E-03 10000 1.0E+00 000078-00-2 Tetraethyl lead 1000* 11* 0.0200* Yes* Yes 1000* 5000.0* 5000.0* 5000.0* 0.4000 0.0700 5000.01 2.0E-01* 1.0E+00 003689-24-5 1000 Tetraethyldithiopyrophosphate 17 1.0000 Yes No 0.5 0.5 0.5 0.5 1.0E+00 1.0E+00 0.4000 1.0000 1.0E+00 1.0E+00 000109-99-9 Tetrahydrofuran No Yes 1001 50.0 500.0 50.0 500.0 1.0E+00 1.0E-04 1.0000 1.0000 1.0E+00 1.0E-04 100* 007440-28-0 Thallium

^{*} Indicates difference between previous version of chemical data (JUN94) and current version of chemical data (JUN96).

gardous substance in current version of chemical data (JUN96). ** Indicates ng





AIR PATHWAY

GROUND WATER PATHWAY

		AIR PATHWAY			drooms with the			
Substance Name	CAS Number	NAAQS. NESHAPS (ug/m ² 3)	Reference Dose Screen Conc (mg/m ² 3)	Cancer Risk Screen Conc (mg/m ³)	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	
Silver	007440-22-4	•••		•••	•••	1.8E-01*	•••	
	000506-64-9			•••	•••	3.7E+00*	•••	
Silver Cyanide Sodium	007440-23-5		•••	•••	•••	•••	•••	
	·							
Strontium	007440-24-6		•••	•••	•••	2.2E+01*	•••	
Strychnine	000057-24-9		•••	•••	•••	1.1E-02*	•••	
Styrene	000100-42-5		1.0E+00*	•••	1.0E-01	7.3E+00*	•••	
Sulfuric acid	007664-93-9	·	•••	•••	•••	•••	•••	
тв, 2,4,5-	000093-80-	ı	•••	•••	•••	•••	•••	
TCDD	001746-01-0	s	•••	5.0E-11*	3.0E-08	• • •	5.3E-10*	
Tetrachlorobenzene, 1,2,4,5-	000095-94-	3	•••	• • •	•••	1.1E-02*	•••	
Tetrachlorodibenzofuran, 2,3,7,8-	051207-31-	·	•••	5.3E-10*	•••	•••	5.3E-09*	
•				3.3E-04*	•••	1.1E+00*	3.3E-03*	
Tetrachloroethane, 1,1,1,2-	000630-20-		•••	4.2E-05*	•		4.3E-04*	
Tetrachloroethane, 1,1,2,2-	000079-34-		• • •		5.0E-03	3.7E-01*	1.6E-03*	
Tetrachloroethylene	000127-18-	4	•••	• • • *		1.1E+00*		
Tetrachlorophenol, 2,3,4,6-	000058-90-	2	•••	•••	•••			
	000078-00-	2	• • •	•••	•••	3.7E-06*	•••	
Tetraethyl lead	003689-24-			•••	•••	1.8E-02*	•••	
Tetraethyldithiopyrophosphate			•••	•••		•••	•••	
Tetrahydrofuran	000109-99-		•••		5.0E-04	• • •	•••	
Thallium	007440-28-	0	•••	•••				

^{*} Indicates difference between previous version of chemical data (JUN94) and current version of chemical data (JUN96).
** Indicates new hazardous substance in current version of chemical data (JUN96).

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REFERENCE NO. 3



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 2 290 BROADWAY NEW YORK, NY 10007-1866

<u>ACTION MEMORANDUM</u>

DATE:

2

SUBJECT:

Documentation of Verbal Authorizations and Request for a Removal Action and

Ceiling Increase at the Smithtown Groundwater Site, Smithtown, Suffolk County,

New York

FROM:

David Rosoff, On-Scene Coordinator

Eric J. Wilson, On-Scene Coordinator

Removal Action Branch

TO:

Richard L. Caspe, Director

Emergency and Remedial Response Division

THRU:

Richard C. Salkie, Chief

Removal Action Branch

Site ID No. KQ

I. PURPOSE

The purpose of this Action Memorandum is to document two verbal authorizations as well as to request authorization for a removal action and ceiling increase to conduct the proposed removal activities described herein for the Smithtown Groundwater Contamination Site (Site), Smithtown, Suffolk County, New York. The Emergency and Remedial Response Division (ERRD) Director's April 8, 1998 verbal authorization provided a total project ceiling of \$15,000 to initiate a removal action providing bottled water delivery to homes on the Site with wells

contaminated with tetrachloroethene (PCE) at levels in excess of the Removal Action Level (RAL). On June 25, 1998 the ERRD Division Director verbally authorized an additional \$10,000 in mitigation funds to initiate the delivery of bottled water to homes on the Site contaminated above the Maximum Contaminant Level (MCL) for PCE. The total project ceiling authorized to date is \$25,000.

Conditions at the Site continue to meet the criteria for a removal action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as documented in Section 300.415(b)(2) of the National Contingency Plan (NCP).

The action proposed in this memorandum is to install granular activated carbon (GAC) treatment units in homes with wells contaminated with PCE above the Federal and New York State MCL of five parts per billion (ppb), and to continue to provide these homes with bottled water until the treatment systems are installed. The proposed removal actions are expected to cost an additional \$225,000 which will bring the total estimated project ceiling to \$250,000.

There are no nationally significant or precedent-setting issues associated with this removal action.

II. SITE CONDITIONS AND BACKGROUND

This Action Memorandum documents the proposed time-critical action for the Site. The Comprehensive Environmental Response, Compensation and Liability Information System ID number for the Site is NY0002318889.

A. Site Description

1. Removal site evaluation (RSE)

The U.S. Environmental Protection Agency (EPA) received a written request on October 9, 1997 from the New York State Department of Environmental Conservation (NYSDEC) to provide assistance in funding alternative water supplies for residences affected by contaminated groundwater. Included with NYSDEC's request for assistance was a private well sampling survey, prepared by the Suffolk County Department of Health Services (SCDHS), which presented drinking water survey results from 34 private wells in the area. The survey did not show that the RALs were exceeded for any hazardous substances (Appendix A).

Additional sampling of residences by SCDHS, submitted to EPA in January 1998, showed levels of PCE, a hazardous substance, exceeding RALs of 70 ppb. To date, SCDHS has collected samples from approximately 150 private wells in the Villages of Nissequogue, Head of the Harbor and the Hamlet of St. James, the areas that make up the Site. SCDHS discovered that 23 residences were contaminated with PCE above the MCL of five ppb. Four of these residences had concentrations of PCE exceeding EPA's RAL. As a follow up to the sampling conducted by SCDHS, EPA sampled 295 homes in the area to determine the extent of PCE contamination. Based on all the sampling data generated by both SCDHS and EPA, a total of 33 residential wells

have been identified as being contaminated with PCE (or its breakdown products) at concentrations above the MCLs (see Appendix B). The RAL for PCE has been exceeded in six private wells. SCDHS has advised all affected residents not to use the water for drinking or cooking purposes and to limit exposure through direct contact. In April 1998, EPA began the delivery of bottled water to four of the residences contaminated above the RAL for PCE (the other two residences had already installed GAC treatment systems). In June 1998, EPA expanded the delivery of bottled water to homes where the MCL for PCE or its breakdown products was exceeded and whose residents were interested in receiving the bottled water.

2. Physical location

The Site is located in the Town of Smithtown in an area encompassed by the Villages of Nissequogue and Head of the Harbor and by the Hamlet of St. James (See Figure 1). The homes in this area use private wells for potable water supply and septic systems for sanitary waste water disposal. At this time, the affected area is not serviced by a public water supply, although water mains are available to the south and east immediately adjacent to the contaminated areas. The Site is situated south of Stoney Brook Harbor and east of the Nissequogue River.

3. Site characteristics

Wells contaminated above the RAL and MCL for PCE are located in the Village of Nissequogue, the Village of Head of the Harbor and the Hamlet of St James. The area is primarily residential with some light commercial industry to the east in the Village of St. James and to the south in Town of Smithtown. The majority of residences within the project area rely on ground water as their sole source of potable water. The soil in the area is primarily sandy with discontinuous clay lenses.

According to information provided by SCDHS and preliminary information gathered by EPA, the source of the groundwater contamination has not yet been determined. However, SCDHS is currently investigating eleven current or former commercial/industrial facilities in the area. All these facilities are located to the east of the Site. Groundwater in this area flows from the southeast to the northwest toward the Nissequogue River and Stoney Brook Harbor.

4. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant

Sampling conducted between 1996 and 1998 by SCDHS and in April 1998 by EPA has identified 33 private wells at the Site which are contaminated with volatile organic compounds (VOCs), primarily PCE, in concentrations above the Federal and New York State MCLs. Six of these homes are contaminated above the RAL for PCE.

The materials below in Table I are CERCLA-designated Hazardous Substances, as listed in 40 CFR Table 302.4. This data is only a summary of the more pertinent analytical information available for the Site.

Table I - Smithtown Groundwater Contamination Site, Smithtown, NY

CONTAMINANT	MAXIMUM * CONCENTRATION FOUND (ppb)	STATUTORY SOURCE FOR DESIGNATION AS A HAZARDOUS SUBSTANCE UNDER CERCLA	EPA RAL (ppb)	EPA MCL (ppb)	
1,1,1 Trichloroethane	10	1,2,3	1000	200	
Tetrachloroethene	200	1,2,3	70	5	
Trichloroethene	6.2	1,2,3	300	5	

Legend

- 1. Clean Water Act, Section 311(b)(4)
- 2. Clean Water Act, Section 307(a)
- 3. RCRA Section 3001
- * Based on sampling results from SCDHS (1996-1998) and EPA (April 1998)

5. National priorities list (NPL) status

The Site is not listed on the NPL.

NYSDEC has not investigated the Site to determine the Hazardous Ranking System Score (HRS). EPA's preremedial program, in conjunction with the Removal Action Branch, has performed an Integrated Site Assessment (IA) to determine if the site should be listed on the NPL. Based on the results of the IA, EPA is planning to propose the Site for listing on the NPL. An HRS package is currently being prepared.

6. Maps, pictures and other graphic representations

See Figures 1 and 2.

B. Other Actions To Date

1. Previous actions

Verbal authorizations have been granted to undertake a removal action to deliver bottled water to those residences identified as having contaminated wells exceeding the MCL and the RAL for PCE and its breakdown products. This removal activity was initiated on April 8, 1998 for homes exceeding the RAL and June 25, 1998 for homes exceeding the MCLs. Such actions represents an interim measure to protect the health of the public until a more permanent solution to the problem can be implemented. Some residents have already installed water treatment systems in their homes.

2. Current action

Under this Action Memorandum, EPA will provide residences that are contaminated with site-related VOCs above MCLs with GAC treatment systems.

The treatment systems will effectively remove VOCs from the well water and provide affected residents with a safe potable water supply that can be used for all domestic purposes.

C. State and Local Authorities' Roles

1. State and local actions to date

The SCDHS is taking a supportive role at the Site. SCDHS has and continues to sample wells in the vicinity of the Site at the request of the residents. This activity will assist in identifying additional contaminated wells and in determining the movement of contaminants in groundwater.

SCDHS has also installed five monitoring wells on the Site in an attempt to locate the potential source or sources of contamination. SCDHS is also actively investigating potential sources of contamination by sampling the septic systems of businesses in the area that may be responsible for the groundwater contamination.

2. Potential for continued State/local response

SCDHS will continue to test wells upon request by individual residents at the Site. It will also continue its investigation of potential sources. Residential well data collected by SCDHS will be used to monitor the movement of the plume and to determine if and when additional homes will need to be supplied with GAC treatment systems.

NYSDEC is not currently able to undertake timely response actions to eliminate the threats posed by the Site. Furthermore, the local government does not have the resources necessary to provide a safe drinking water supply in a timely manner.

The responsibility of maintenance for these GAC treatment system units, after installation, is dependent upon several factors. If the Site is listed on the NPL, EPA will have the necessary authority to provide Operation and Maintenance (O&M) until a permanent solution is implemented. If the Site is not listed on the NPL, EPA will request that NYSDEC provide for the O&M of the treatment systems. If NYSDEC is unable to provide O&M, it will be necessary for each homeowner to operate and maintain their own system.

Residents in certain areas of the Site have contacted the Suffolk County Water Authority to inquire about the feasibility and cost of extending water mains to specific affected areas. Residents from some effected areas are actively trying to gain community support to purchase waterline extensions at their own cost.

III. THREATS TO PUBLIC HEALTH, OR WELFARE, OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare

Conditions at the Site continue to meet the criteria for a removal action under Section 40 CFR 300.415(b)(2) of the NCP. Qualifying criteria for the threats to the public health and welfare include the following:

(ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;

The results generated by SCDHS sampling between 1996 and 1998 and EPA's April 1998 sampling identified 33 wells contaminated by PCE (or its breakdown products) in excess of the Federal and State MCLs of 5 ppbs (see Appendix B). EPA's RAL of 70 ppb is exceeded in six of these wells.

Exposure to PCE and VOCs can occur from ingestion of contaminated water, ingestion of food prepared with contaminated water, or inhalation of vapors. Vapors of hazardous VOCs can accumulate in the air within the home as a result of the normal household use of contaminated water. Running household appliances such as humidifiers, dishwashers, and clothes washers or performing routine activities such as taking showers and cleaning the house can increase the concentration of vapors in air inside the home.

The associated health effects from exposure to PCE at elevated concentrations is provided below:

SUBSTANCE

HEALTH EFFECT

Tetrachloroethene

A,B,C,D,E,G

- A Eye, skin, respiratory irritant
- B Liver damage
- C Kidney damage
- D Toxic by inhalation, ingestion, or dermal contact
- E Carcinogenic
- F Mutagenic
- G Central nervous system effects

Available data also indicates that single exposures of high concentrations of PCE, when inhaled, can effect the central nervous system resulting in dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking as well as walking, possibly unconsciousness and death. The acute effects as described previously would result from a PCE exposure to 100 parts per million, a

concentration orders of magnitude greater than the levels expected from the contaminant present at the Site. The health effect of greatest concern for the Smithtown Site is the long term carcinogenic effects of PCE.

(vii) The availability of other appropriate federal or state response mechanisms to respond to the release;

EPA is the only government agency capable of taking necessary timely and appropriate actions needed to respond to the threat posed by the presence of hazardous substances at the Site. As discussed in Section II. C., state and local authorities are not able to undertake timely response actions to eliminate the threats at the Site.

B. Threat to the Environment

Groundwater, a natural resource, has been determined to be contaminated with VOCs. At this time the extent of the threat to the environment cannot be clearly defined since the size of the plume is unknown. The Site is bordered by the Stony Brook Harbor and the Nissequogue River. Residential wells directly adjacent to the harbor are known to be contaminated above the RAL. Sampling data thus far appears to indicate the contamination is moving in a northwest direction toward the these bodies of water.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The GAC treatment systems will be installed in homes with wells that are contaminated with Site related VOCs which exceed MCLs in order to address the threats that currently exist at the Site. These systems can effectively reduce Site-related VOC concentrations below MCLs and are easily maintained and operated. The GAC unit will be supplemented with both a pre-treatment particulate filter for sediment control and a post treatment UV light for disinfection.

Site-related VOCs have been identified at concentrations exceeding MCLs of 5 ppbs in the water supply to 33 homes. Several homeowners have had treatment systems installed in their homes at their own expense. EPA will install new GAC treatment systems or upgrade existing systems as necessary to ensure a potable water supply is provided to these homes. If additional residences

are identified in which Site-related VOCs are found to exceed MCLs, they will be provided with treatment systems, where possible, and where this can be accomplished within project budget and statutory time limitations. This action will include necessary sampling and O&M activities. The statutory time limitation as set forth in Section 104 of CERCLA, 42 U.S.C. § 9604 on this project means that the removal action (including O&M) is to end April 1999.

2. Contribution to remedial performance

This Site is not on the NPL, but it is currently being evaluated for potential inclusion. The actions proposed in this memorandum will address the threats posed by hazardous substances to public health by providing a safe drinking water supply to affected residences. The proposed action would not adversely affect any plans for long-term remediation of the aquifer. The selected removal action will assist in any long-term remediation of groundwater contamination by providing treatment at the wellhead.

3. Description of alternative technologies

Three alternatives have been considered to address the threat that currently exists at the Site: GAC with ultraviolet (UV) light treatment, air stripping with UV light treatment and the extension of the SCWA water main to the affected areas.

(i) GAC with UV treatment

GAC with UV units can provide populations at risk with acceptable temporary protection. GAC units are reliable and easily maintained and operated, but require some monitoring, operation and maintenance (MO&M) to function properly. UV treatment would be provided to protect the water supply from bacterial contamination.

(ii) Air strippers with UV treatment

Air strippers with UV units can provide populations at risk with acceptable temporary protection. Air Strippers may require a heated enclosure outside the home. The initial expenditure for air strippers is greater than that for GAC treatment systems, but maintenance requirements for the air stripper are minimal in comparison. These systems do, however, require regular monitoring. UV treatment would be provided to protect the water supply from bacterial contamination. Installation of residential air strippers presents certain logistical and aesthetic concerns for the affected residents. Of particular concern is the placement of the off-gas vent pipe which must be attached to the outside of the home and extended at least two feet above the roof-line.

(iii) Public water main extension

The nearest water mains to the Site, located along Nissequogue River Road and Moriches Road, are within two miles of the furthest residential wells that exceed the MCL for PCE. Due to the size of the properties on the Site (two acre lots), the extension of water mains to affected areas

would require a substantially greater capital expenditure than the household treatment system options.

EPA has selected the installation of GAC units with UV treatment as the most cost effective and efficiently installed response alternative available for the Site.

4. Engineering Evaluation/Cost Analysis (EE/CA)

Due to the time-critical nature of this removal action, an EE/CA will not be prepared.

5. Applicable or relevant and appropriate requirements (ARARs)

Federal ARARs for the Site are standards pursuant to the Clean Water Act and the Safe Drinking Water Act, which will be met to the extent practible.

6. Project schedule

The procurement and subsequent installation of the GAC units will begin following approval of this action memorandum. EPA will coordinate with the affected residents to schedule the treatment system installation. After the treatment systems are installed, monitoring of system performance and maintenance will be performed by EPA for the duration of the removal action or until responsibility is assumed by the state or individual home owner. The removal action will be completed within the one year CERCLA statutory limit.

B. <u>Estimated Costs</u>

This project involves the installation of water treatment systems at residences where site-related VOCs were found in the water supply at levels exceeding MCLs; 33 residences currently meet this criteria. This action will also include necessary sampling and O&M activities. Funds not utilized for these purposes may be used for the installation and O&M of treatment systems at additional qualifying residences identified during the course of the removal action. The estimated costs for the completion of this project are summarized below.

	Current Ceiling	This Action	Proposed Ceiling
EXTRAMURAL COSTS:			
Regional Allowance Costs: ERRS Cleanup contractor: (including contingency)	\$20,000	\$145,000	\$165,000
Other Extramural Costs: START	<u> </u>	20,000	20,000

Subtotal Extramural Costs Extramural Cost Contingency	\$20,000 0	\$165,000 33,000	\$185,000 <u>33,000</u>
TOTAL EXTRAMURAL COSTS	\$20,000	\$198,000	\$218,000
INTRAMURAL COSTS:		÷ .	
Intramural Direct Costs Intramural Indirect Costs	\$ 1,500 3,500	\$ 9,000 	\$ 11,000 21,000
TOTAL INTRAMURAL COSTS	\$ 5,000	<u>\$ 27,000</u>	<u>\$ 32,000</u>
TOTAL PROJECT CEILING	\$25,000	\$225,000	\$250,000

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the funds for the removal action described herein are not authorized, the hazardous substances in the contaminated groundwater will continue to pose a threat to human health and welfare and the environment.

VIII. OUTSTANDING POLICY ISSUES

None.

IV. ENFORCEMENT

An investigation into identifying the source of contamination is underway. Should a responsible party or parties (PRPs) be identified and be willing to undertake timely and appropriate corrective action, all or part of the funds requested herein may not be spent. EPA will be pursuing CERCLA enforcement actions concurrently with the time-critical removal action requested herein.

X. RECOMMENDATIONS

This decision document represents the selected removal action for the Smithtown Groundwater Contamination Site, which is located within the Smithtown, Suffolk County, New York. This document was developed in accordance with CERCLA, as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site continue to meet the NCP Section 300.415(b)(2) criteria for a removal action. The total project ceiling for this removal action if approved will be \$250,000 of which

\$165,000 comes from the Regional removal allowance. There are sufficient monies in our current Advice of Allowance to fund this project.

I recommend your approval of the verbal authorizations for funding as well as a request for a removal action and ceiling increase for the Smithtown Groundwater Site, as per current Delegation of Authority, by signing below.

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Richard L. Caspe, Director

Emergency and Remedial Response Division

Disapproved:

Richard L. Caspe, Director
Emergency and Remedial Response Division

cc: (if approval is obtained)

- J. Fox, RA
- W. Muszynski, DRA
- R. Caspe, ERRD-D
- R. Salkie, ERRD-RAB
- J. Rotola, ERRD-RAB
- J. Witkowski, ERRD-RAB
- J. Yu, ORC-NYSUP
- B. Bellow, CD
- M. Cervantes, CD
- C. Echols, CD
- S. Murphy, OPM-FAM
- P. Simon, ORC-NYCSUP
- R. Gherardi, OPM-FIN
- T. Johnson, 5202G
- P. McKechnie, OIG
- M. O'Toole, NYSDEC
- B. Stewart, NYSDEC
- G. Wheaton, NOAA
- A. Raddant, DOI
- O. Douglas, START

APPENDIX A
Request from NYSDEC

Car 3 13 37 All 137



27 - 3

Mr. Richard Caspe
Director
Emergency & Remedial Response Division
USEPA, Region II
290 Broadway
New York, New York 10007-1866

Dear Mr. Caspe:

Re: Groundwater Contamination
Town of Smithtown, Suffolk County, NY

I have enclosed a package of information and correspondence regarding low level, but widespread, groundwater contamination in the Villages of Head of Harbor and Nissequogue and the Hamlet of Saint James, all in the Town of Smithtown, Suffolk County, New York.

The Suffolk County Department of Health Services (SCDHS) was informed by NYSDEC letter dated August 27, 1997 that the NYSDEC could take no action as the situation does not appear to be caused by a listed Class 2 Inactive Hazardous Waste Disposal Site and further that there are no exceedences of USEPA Removal Action Levels. Additionally, NYSDEC Commissioner Cahill, in a letter dated September 22, 1997, responded to Congressman Forbes' request of June 24, 1997 and reiterated the situation that neither State nor Federal eligibility criteria are met for funding.

However, the SCDHS has requested that the NYSDEC write to the USEPA in their behalf and request that this situation be reviewed to determine if any alternatives exist at the federal level to assist in finding and/or funding an alternate water supply to the effected areas.

This letter is a formal request for such a review.

If you have any questions, please call Richard Koelling, P.E., at (518) 457-9280 or Robert Becherer, P.E., of the NYSDEC Region 1, Long Island, Office at (516) 444-0240.

Sincerely,
Me If Hoole Je

Michael J. O'Toole, Jr.

Director

Division of Environmental Remediation

Enclosure

cc: w/Enc. B. Sprague, USEPA Region II, Edison, NJ

w/o Enc. G. A. Carlson, NYSDOH R. Salkie, USEPA Region II, Édison, NJ

G. Zachos, USEPA Region II, Edison, NJ



Robert J. Gaffney SUFFOLK COUNTY EXECUTIVE

DEPARTMENT OF HEALTH SERVICES

CLARE B. BRADLEY, M.D., M.P.H.
ACTING COMMISSIONER

July 28, 1997

Mr. Robert Becherer
New York State Department of Environmental Conservation
Hazardous Waste Remediation Program
SUNY, Building 40
Stony Brook, N.Y. 11794

Dear Mr. Becherer:

I am writing to request remediation of a hazardous waste disposal site located in the Incorporated Village of Head of the Harbor, the Incorporated Village of Nissequogue, and an unincorporated section of St. James in the Town of Smithtown. Assistance under the state superfund program or a USEPA CERCLA Removal Action is requested to provide a safe drinking water supply to a total of homeowners whose private wells have been contaminated with a number of chemicals, including tetrachloroethene, dichloropropane, trichloroethane, TCPA (dacthal metabolite), and nitrate.

Between June 1996 and July 1997, the department tested a total of 78 private residential wells to delineate the areas of contamination. The source or sources of these contaminants has not been defined at this time. The geographic distribution of specific chemicals and/or combinations of chemicals at this point suggests no connection to normal residential activities. Wells containing contaminant concentrations exceeding prevailing state or federal Maximum Contaminant Levels are as follows:

Tetrachloroethene ranging between the MCL of 5 ppb and 34 ppb at 11 locations Dichloropropane ranging between the MCL of 5 ppb and 14 ppb at 2 locations Trichloroethane as high as the MCL of 5 ppb and at 1 location cis-1,2 dichloroethane as high as the MCL of 5 ppb, at 6 ppb at 1 location TCPA ranging between the MCL of 50 ppb and 99 ppb at 3 locations Nitrate ranging between the MCL of 10 mg/L and 25.5 mg/L at 3 locations

OFFICE OF THE COMMISSIONER 225 RABRO DRIVE-EAST HAUPPAUGE, NEW YORK 17788-4298 (516)853-3005 Fax. (516)853-2927 Other locations have detectable levels of these chemicals. In addition, other chemicals of concern have been detected at levels below prevailing MCLs, as follows:

Chloroform, in concentration as high as 5 ppb

1,1 dichloroethane, in concentration as high as 1 ppb

Trichloroethene, in concentration as high as 4 ppb

1,1 dichloroethane, in concentration as high as 3 ppb

Dichlorodifluoromethane, in concentration as high as 3 ppb MTBE, in concentration as high as 1 ppb Chlorodifluoromethane, in concentration as high as 2 ppb

Additionally, we are reviewing other sampling data for the area for the 1994-1997 period for further clarification of the extent of these drinking water quality deficiencies, and are continuing private well sampling in proximity to the known positive results.

The Suffolk County Department of Health Services has advised affected residents to limit use as appropriate, ie. not to use the water for drinking or cooking purposes, or in the case of nitrate contamination, for infant consumptive purposes. Additionally, for the volatile organic contaminants encountered, residents have been advised to limit inhalation route exposure, ie. showering, laundering and other cleaning activities. The type of chemicals detected in these wells may pose a significant health threat to area residents. It is requested that mitigative action be implemented in an expedited manner.

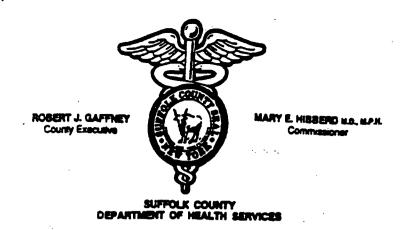
A survey report and other supportive documentation is enclosed.

Should you have any questions on the data, or require further information, please contact Paul J. Ponturo, P.E. Supervisor of the department's Bureau of Drinking Water. Thank you for your cooperation in this matter.

Very truly yours,

Clare B. Bradley, M.D., M.P.H.

Acting Commissioner



VILLAGE OF HEAD OF THE HARBOR 1996 PRIVATE WELL SAMPLING SURVEY

SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES OFFICE OF WATER RESOURCES

Mary E. Hibberd, M.D., M.P.H. Commissioner

Joseph Baier, P.E., Director Division of Environmental Quality

MAY 1997

Prepared by: Thomas Nanos R.S., Senior Public Health Sanitarian

BACKGROUND

In August of 1996 the Suffolk County Department of Health Services was asked by the Village of Head of the Harbor to repeat a study of private well water quality previously conducted in 1994. A total of thirty-four (34) wells were sampled. All the sites sampled were chosen by the Village.

As part of county-wide activities to evaluate the extent of pesticide contamination of private wells, just prior to the start of this study, we began another Village-wide survey of drinking water quality aimed specifically at detection of the herbicide, Initially individual households in proximity to known activities were invited to participate. This precipitated by a detection of an elevated sub-survey was concentration of that compound during a routine private well sampling. That effort is still continuing at this time with Bureau staff now seeking to sample specific homes that may have a greater likelihood of contamination.

Another sub-survey began near the conclusion of the primary survey directed at the detection of Volatile Organic Compounds (VOCs) in a specific area of the Village after elevated concentrations of the compound, tetrachloroethene, in that specific locale were discovered during the course of the primary

Plate 1 indicates sampling locations for the Village Sampling Survey as well as the sub-surveys.

SAMPLING SUMMARY

The results of the sampling indicate the following:

1) iron was detected in eight wells (23 %) exceeding the standard of .3 mg/1; the average concentration detected in all wells was

- 2) nitrates were detected in all wells with the average concentration recorded being $6.05~\rm mg/l$ (>60 % of the Maximum Contaminant Level of 10 $\rm mg/l$); one well was measured with a concentration 10 $\rm mg/l$ and another had a concentration of 11.6 $\rm mg/l$
- 3) tetrachloroterephthalic acid (a breakdown product of the herbicide, Dacthal) was detected in five wells in the primary the five detections recorded being 46.4 ppb
- 4) Volatile organic compounds (VOCs) were detected in twenty-one wells (62 %) with three, (9 %) having exceedances of their respective MCLs.

Each of these findings is described in expanded detail below.

INORGANIC CHEMICAL RESULTS

IROM

Iron is not normally considered harmful to health, but is the most frequent source of the off-taste, odor or staining complaints received by the Bureau. The average concentration of iron detected was .22 mg/l. Eight wells had concentrations ranging from .33 mg/l to 1.9 mg/l exceeding the drinking water standard of 0.3 mg/l. Please see Table # 1 for a summary of the iron concentrations detected. This department recommends connection to a public water supply wherever possible. If public water is not available, aesthetic problems caused by iron concentrations of less than one milligram per liter may be minimized by installation of a polyphosphate feeder. This treatment device does not remove iron from the water. Iron removal is desirable for iron concentrations in excess of one milligram per liter and can be accomplished by the filtration processes of oxidation or ion exchange. The sodium concentration in the water will be increased by treatment units which are regenerated with salt.

Nitrate

Nitrate contamination of groundwater is commonly attributed to the residential and agricultural use of fertilizers, leachate from sewage disposal systems and from animal manure. nitrate may be harmful to infants under one year of age. A water supply containing nitrate in excess of the MCL should not be consumed by an infant or used in the preparation of infant The nitrate MCL is 10.0 milligrams per formula. wells had detectable concentrations of nitrate with twenty- three, (68 %) having concentrations greater than 50 % of the MCL. well exceeded the standard with a concentration of 11.6 while another was just at the MCL with a finding of 10 mg/1. Please see Plate # 2 for a graphic representation of the nitrate concentrations observed. Refer to Table # 1 for a summary of the nitrate concentrations detected.

This department recommends connection to a public water wherever possible. If public water is not available, supply concentrations can be reduced by the installation of nitrate water treatment utilizing reverse osmosis or distillation Should one decide to install a reverse osmosis unit, processes. note that although this treatment system is capable of removing nitrates, the efficiency is dependent upon concentration and/or the levels of other inorganic constituents the in the water as well as various other operational factors. Therefore, a competent professional should be consulted regarding the installation of this type of system.

TETRACHLOROTEREPHTHALIC ACID (& breakdown product of the herbicide, Dacthal)

A breakdown product of the herbicide, Dacthal was detected in the primary study in five, (15%) of the wells sampled with two having concentrations exceeding the MCL of 50 parts per billion (ppb) with concentrations of 56 and 68 ppb having been recorded. The average of the detections recorded was 46.4 ppb; positive samples ranged from 31 to 68 ppb. Dacthal is a general use herbicide used for the control of broadleaf weeds in turf and on many vegetable crops. A national survey conducted by the United States Environmental Protection Agency named terachloroterephthalic acid as the most frequently detected pesticide in drinking water wells. This department recommends connection to a public water supply whenever possible. However, limited testing by this department has shown that granular activated carbon (GAC) filtration may be effective for removal of this chemical from drinking water. Experience has shown that ongoing monitoring and maintenance are necessary for continued optimal removal of this contaminant.

In 1989, the New York State Attorney General filed a lawsuit against the makers of Dacthal. Unfortunately, relief for private homeowners with contaminated wells was not granted at that time by the courts. As of this writing the Attorney General is considering an appeal of this ruling.

In the village-wide, Dacthal-only sub-survey twenty-four additional wells have been sampled thus far with three wells (12.5 %) having detections. One of these detections exceeded the MCL of 50 ppb with a concentration of 80 ppb having been recorded. The two other wells had detections measuring thirty-four and forty one ppb. Please refer to Plate # 3 for a representation of those locations sampled in the SCDHS sub-survey. Table # 2 provides details of the concentrations detected in the sub-survey. The Dacthal-only survey is on-going with locations in the village now being targeted for sampling by the Bureau particularly homes on the Bacon Road, Valleywood Courts East and West, Briarwood, Victoria and Nadia Courts, Saneck Road, Brackenwood Path and portions of Harbor Road.

VOLATILE ORGANIC CHEMICAL (VOC) RESULTS

Volatile Organic Compounds (VOCs) have been used in formulations of motor fuels, cleaning solvents, degreasing agents and as "active" and "inactive" ingredients in certain pesticides. Information on each of those compounds detected in this study follows later in this section. Whenever private well water is

found to be contaminated we recommend connection to a community water supply. Concentrations of VOCs can be reduced by granular activated carbon treatment.

The locations of detections of VOCs in the primary survey and sub-surveys are shown on Plate 4.

Of the thirty-four wells sampled in the primary survey fourteen, (41 %) had detection of one or more solvents. One well indicated solvent chemical concentrations in excess of the New York State Department of Health (NYSDOH) Maximum Contaminant Levels (MCL) of 5 parts per billion (ppb). Solvents were detected in all seven of the sites sampled in the SCDHS VOC sub-survey, three exceeding an MCL. Our evaluation of data led to a conclusion that all 10 detections of 1,2-dichloropropane were from agricultural sources. In total nine different VOC compounds were detected. Not all VOCs were found at every location. Plate # 1 provides a graphic representation of the sites sampled for the VOCs in the primary study. Please refer to Table # 1 for a summary of the concentrations of the specific compounds detected. summary of their frequency of detection follows below.

VOLATILE ORGANIC COMPOUND	# OF WELLS WITH DETECTIONS
1,1,1-trichloroethane	11
1,2 dichloropropane .	10
1,1-dichloroethane	4
tetrachloroethene	4
1,2,3-trichloropropane	2
methyl tertiary butyl ether	1
chloroform	1
trichloroethene	1
1,1 dichloroethene	. 1

The following is some brief information on each of the VOCs detected in the study:

1,1,1-TRICHLOROETHANE

The major use of 1,1,1-trichloroethane is as a solvent in metal degreasing and cleaning. It has a variety of other solvent uses and, as a chemical building block, is used to make other chemicals. 1,1,1- trichloroethane is also found in some commercial products such as stain removers. There are no natural sources of 1,1,1-trichloroethane (i.e., it is a man-made chemical).

1,1-DICHLOROETHANE

A breakdown product of 1,1,1-trichloroethane

TRICHLOROETHEME

The major use of trichloroethene is as a solvent used in metal degreasing and cleaning. It has a variety of other solvent uses and is used as a chemical building block to make other chemicals. There are no natural sources of trichloroethene.

1,1-DICHLOROETHENE

A breakdown product of trichloroethene.

1, 2-DICHLOROPROPANE

It is used as a soil fumigant; as a solvent for metal degreasing, fats, oils, waxes, gums and resins; as an intermediate in the manufacture of other chemicals; as a lead scavenger for anti-knock fluids; and in dry cleaning fluids. There are no natural sources of 1,2-dichloropropane. Our evaluation of data in this particular survey led to the conclusion that our detections here relate to agricultural activities. Therefore locations of detections of this compound are shown on Plate 4 as pesticide

TETRACHLOROSTHEME

The major use for the chemical is as a solvent for dry cleaning fabrics and textiles and for metal degreasing operations. It is also used as a chemical building block to make other chemicals. There are no natural sources of tetrachloroethene.

1,2,3-TRICHLOROPROPANE

Used exclusively as a pesticide.

TOLUENE

Toluene is a common solvent with a variety of uses including paints, laquers, adhesives, dyes and rubber. Toluene is also a component of gasoline.

METHYL-TERTIARY-BUTYL-ETHER Used exclusively as a gasoline additive.

CHLOROFORM

Is a by-product resulting from the combination of certain household chemicals and disinfectants, such as chorine, with organic and inorganic matter present in the ground water. There are no natural sources of chloroform.

The sub-survey for VOCs continues in the area of Carmans Lane with seven sites having been sampled thus far. All sites had detections with three, (43 %) having had MCL exceedances noted. The compound tetrachloroethene was observed several wells at elevated concentrations measuring 25, 17 and 34 ppb. The MCL for this compound is 5 ppb. Please refer to Table # 3 for details relating to this sub-survey. The sites included in the VOC sub-survey are indicated on Plate 4.

Another VOC, 1,2-dichloropropane, was measured at elevated concentrations exceeding the MCL (16 and 7 ppb) in two locations decided removed from each other. Therefore additional survey work is indicated to determine the extent of the concentrated area of each plume. The MCL for this compound is also 5 ppb.

DISCUSSION

The inorganic chemistry of the area may be regarded as

marginal. The average nitrate concentration recorded was 6.05 mg/l which, at > 50 % of the MCL, is considered significant by this Bureau indicating area- wide nitrate concentrations worthy of continued monitoring. Experience tells us that this trend of increasing nitrate concentrations will continue with expanded development.

Iron, while not of public health concern, is the most frequent cause of consumer dissatisfaction owing to the off-taste, staining, off-color and odor problems it causes. Twenty-three percent (23 %) of all the homes sampled had excessive concentrations of iron, the village-wide average concentration measured .22 mg/l. The MCL for iron is .3 mg/l therefore iron has the potential, as with nitrate, of becoming a community-wide contaminant of concern.

In many parts of the United States, including Long Island, water sources are naturally soft, with total hardness of 30 mg/l or less. Most untreated well water sources in Suffolk County fall in to this category. These waters are generally corrosive; on Long Island, public water supplies are usually treated to lessen the corrosive tendencies. The measure of pH is regarded as an indicator of the need for corrosion control treatment.

the standpoint of From human health, a relatively non-corrosive water supply is considered desirable to reduce . concentrations of the corrosion by-products, primarily lead, copper and cadmium. These by- products result from contact of the water with plumbing materials within the home. materials such as brass fixtures and fittings Lead bearing commonplace, although the use of high lead content solder was banned for use in potable water supplies in new construction. Copper plumbing systems are almost universal. Cadmium can appear concentrations in nearly any metallic plumbing component.

A second benefit of a non-corrosive water supply is the measurable improvement in the overall operational lifetime of plumbing system components (hot and cold domestic and water distributed space heating). In this survey, the relatively frequent detections of these corrosion by-products are similar to

findings in untreated private wells elsewhere in Suffolk County. The concentrations of these by-products vary with the length of time in which the water may be in contact with such plumbing materials. Because of this, before using the water for drinking purposes, it is considered desirable to flush the cold water lines for several minutes after prolonged periods of non-use (such as overnight). Further it is recommended that hot tap water not be used for cooking or drinking. Cold, flushed tap water from the faucet should be heated on the stove because hot water is more corrosive to household plumbing than cold.

This sampling survey / study confirms some conclusions regarding Village water quality reached as a result of prior studies. For example, the multiple VOC plumes previously defined in the 1994 study were again observed in this study. As indicated then, there appear to be a minimum of two distinct plumes as evidenced by the chemicals detected. The data would suggest these plumes are the result of some historical occurrence such as possible agricultural use in the example of 1,2-dichloropropane. The relative number of occurrences and the compounds observed remained fairly consistent. Given the limited data available, the wide distribution of these contaminants and the limited resources available for further research, the source(s) of the contamination cannot be determined at this time.

Of concern to this office is the intrinsic migratory nature groundwater. The groundwater underlying the Village travels generally northward towards Stony Brook Harbor. As it migrates carries along with it any contaminants it may it picks-up and encounter. Thus while those homes participating in this study have been duly appraised of their drinking water quality our concern is for the many other homes at risk of unknowingly consuming tainted water. Further, because of the comparatively slow movement of the groundwater, those contamination problems identified are likely to persist for an indefinite time period. In the instance of the VOC sub-survey in the Carmens Lane vicinity this Bureau has endeavored to determine the current extent of the concentrated area of the plume. Likewise with the herbicide, Dacthal, we have surveyed sufficiently such that current survey efforts may now be focused on those locations most likely to be

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impacted. Finally, as previously indicated, there are at least two other locations in the Village where additional survey work is justified.

This survey sampling provides a concise picture of water quality at those homes sampled however this only represents perhaps no more than 15 % of the population of the Village. We consider that the same cautionary results may apply to the remainder of the Village population, but note that routine surveillance of every home served by a private well is clearly beyond this Bureau's resources. These water samples may provide a snapshot of water quality at any given instant, but because of the migratory nature of the groundwater and its contaminants, the picture is dynamic, constantly changing and problems are indeed likely to travel from one home to the next. Therefore there are, at no time, assurances of acceptable water quality at any home in the .Village of Head of the Harbor. While treatments for all these contaminants are available, in any case the costs involved include not only the initial purchase expense but on-going expenditures for chemical replemishment, mechanical maintenance and water quality monitoring. Finally, we do not regard it to be an acceptable public policy for private well owners to rely upon complex treatment systems for a similarly complex mix of contaminants of potential health concern.

CONCLUSIONS and RECOMMENDATIONS

This study serves to confirm previous findings regarding the marginal quality of drinking water in the Village of Head of the Harbor. The frequency of the detection of volatile organic chemicals, elevated concentrations of agricultural contaminates, nitrates and iron indicate that a significant portion of the limited aquifer underlying the Village has been contaminated.

Several alternatives are available to address this situation. The residents of the Village may continue to take their drinking water quality for granted. This Bureau has received approximately twelve requests for private well analysis per year in a community of approximately four hundred and thirty homes

indicating the need to raise public awareness of water quality issues. The village should undertake a campaign of community education directed towards a broader understanding of drinking water issues thereby encouraging individual households to avail themselves of this department's program of private well analysis. Residents should also be made aware of the need to dispose of household chemical wastes properly and to use them wisely and sparingly.

The village might underwrite a regular program of private well analyses so that residents may be routinely appraised of their drinking water quality. This program costs might alternately be billed back to the individual households or financed entirely by the Village but the program administration would be managed through Village offices. This would assure that contamination problems are identified on the basis of a regular, routine timeframe to those who participate. A "filter district" might be established wherein any necessary water filters and treatments are provided by the Village with the costs of installation, maintenance and monitoring underwritten by the community at large.

However, the alternative most strongly recommended by this Bureau as the most logical and desirable would be the extension and provision of community water supply to all homes in the Village. In any area where groundwater contamination is found, it is always this department's primary recommendation that public water be extended. The quality of a community water supply is routinely monitored by both the purveyor and, independently, this Bureau. The Federal Safe Drinking Water Act and both New York State and Suffolk County Health Codes require that all community water supplies meet drinking water standards. Thus the public may be assured of the safety of their drinking water.

Village residents may enjoy several additional benefits as a result of the extension of public water in to their community. First reliable flow and adequate pressure are ensured by law under all conditions even during periods of power outage. Enhanced fire protection would be provided through the availability of fire hydrants. Thus residents may realize a

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reduction in fire insurance premiums. Further, our experience has shown that real estate property values are maintained or, more often, enhanced by the extension of a community water supply.

Current maps indicate the presence of Suffolk County Water Authority water mains on the western portion of the Village on Moriches Road going north on Cordwood Path. Based on Water District maps, southern portions of the Village may lie within the boundaries of the St. James Water District with water mains present on the Three Sisters Road, Highland Road and Thompson Hill Road. On the east the Village is bordered by the Stony Brook Water District which serves the communities east of the Stony Brook. Both of these water districts are, in turn, provided with water from the Suffolk County Water Authority. In summary, the Village may have access to a community water supply via several alternate routes. A more detailed evaluation of these possible options by the Village is recommended.

We conclude that it is prudent for the Village to seriously consider the advantages of the formation of a water supply service via connection to the Suffolk County Water Authority. At the present time the State of New York has made available funding for the express purpose of facilitating the extension of community water supply in to communities faced with problems similar to those faced by the Village. This 'Drinking Water State Revolving Fund' (DWSRF) received additional funding this past Fall with the passage of the New York State Environmental Bond Act as well as other recently enacted federal legislation. This program is administered jointly by the New York Department of Health (NYSDOH) and the New York State Environmental Facilities Corporation (NYSEFC). The NYSDOH provides technical assistance with respect to facilities planning and system components. The NYSEFC administers the financial aspects of the DWSRF. The NYSDOH can be reached at 1-800-458-1158 while the NYSEFC can be reached at 1-800-882-9721.

The Suffolk County Water Authority (SCWA) has extensive experience in the realm of water district formation and may be a resource for additional information. A municipality may contact Donald Slotnick at 516-563-0256 for guidelines with respect to SCWA bonding capabilities. Finally, the Office of the State

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Dodge		Sachem Hill PI	Saint James	0800 05200 0100 008000			2	0.7	10	1	1	2	0.8	
Dunton	7	Carmen Lane	Saint James	0801 00600 0100 004000				0.7	1	2	1			
FEMINO				801 00400 0100 006000						1	0.5			[_
Fortunato		River Road	Saint James	0800 05200 0100 004000		0.6		0.5	4	3	1	1		
Franco		Carman St	Saint James	0801 00800 0100 028000					1					_
Garguilo	12	Harbor Road	Head Of Harbor	0801 00600 0100 010000	 	0.5			0.8	1	0.6			
GELFAND				801 00200 0200 008001		<u> </u>								
Gilison		Branglebrink Road	Nissequogue	0802 01200 0100 012000	 	 	0.7	0.6	1	3				
GOLDSTEIN		<u> L</u>	<u> </u>	801 00600 0200 001000	<u></u>	<u></u>	<u> </u>		0.6				0.6	

CHART #1
SUMMARY OF 1996 VILLAGE OF HEAD OF THE HARBOR PRIVATE WELL DATA

TAX MAP #	NAME	DATE	PH I	NITRATE	IRON	1,1Dichloro- ethane	1,1,1- Trichloro- ethane	1,2-Dichloro propane	Tetrachioro- ethene	MTBE	DACTHAL	1,2,3- Trichloro- propane	Chloroform	Trichloro- ethene	1,1,1- Dichlaro- elhene	Total VOCs
	044750	9/9/96	6.3	9.7	<0.1	1.0	3.0	<0.5	0.6	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	4.6
801 00500 0200 015000	BAXTER	11/4/96	6.2	6.4	0.63	· <0.5	1.0	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	1.0
801 00400 0200 010000	BONANNO	9/9/96	6.6	7.4	<0.1	<0.5	0.8	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	8.0
801 00400 0200 004000	BOZZA	10/24/96		6.7	0.44	<0.5	<0.5	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	<0.5
801 00500 0200 012000	BRADSHAW	9/10/96	8.5	.0.7 8.5	0.11	1.0	0.9	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	1.9
801 00300 0200 025000	CARDI		6.0	1.2	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	<0 .5
801 00100 0100 025007	CHAN	9/10/96	6.7	5.5	0.12	<0.5	<0.5	14.0	<0.5	<0.5	<10.0	2.0	<0.5	<0.5	<0.5	16.0
801 00400 0100 016000	CREEDON			6.6	<0.1	<0.5	0.8	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	8.0
801 00400 0200 016000	DALTON	9/9/96	6.5	15.2	0.61	<0.5	<0.5	<0.5	<0.5	<0.5	35.0	<0.5	<0.5	<0.5	<0.5	<0.5
801 00500 0100 022000	DALY	10/24/96				0.5	1.0	<0.5	<0.5	<0.5	31.0	<0.5	<0.5	<0.5	<0.5	1.6
801 00400 0100 006000	FEMINO	10/7/96	6.1	7.3	<0.1		<0.5	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	< 0.
801 00200 0200 008001	GELFAND	9/30/96	7.5	2.0	0.17	<0.5 ≠0.5	<0.5	<0.5	0.6	0.6	<10.0	<0.5	<0.5	<0.5	<0.5	1.2
801 00600 0200 001000	GOLDSTEIN	4/8/96	5.5	5.4	0.14	•	<0.5	. <0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	<0.5
801 00100 0100 010000	GOODMAN	10/28/96		2.4	<0.1	<0.5		<0.5	4.0	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	4.6
801 00600 0100 001001	GRESHIN	12/2/96		6.1	<0.1	<0.5	0.8	0.7	<0.5	<0.5	68.0	<0.5	4.0	<0.5	<0.5	4.7
801 00300 0100 019000	JACINTO	9/30/96		8.8	0.26		<0.5	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	<0.5
801 00100 0100 003000	LAWRENCE	10/30/96		6.9	0.76		<0.5		<0.5	<0.5	<10.0	1.0	<0.5	<0.5	<0.5	8.0
801 00300 0200 010000	MAZZEO	10/7/06		6.5	<0.1	<0.5	<0.5	7.0	<0.5 <0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	∢ 0.
801 00200 0100 019001	MCMILLEN	10/30/96		1.8	0.18		<0.5	<0.5		<0.5	<10.0 <10.0	40.5	<0.5	<0.5	<0.5	<0.5
801 00200 0100 017009	MIRZA	11/4/96	6.4	2.9	0.69		<0.5	<0.5	√0.5			₹0.5	<0.5	<0.5 <0.5	<0.5	3.0
801 00400 0100 020000	MURPHY	10/28/96	7.1	5.9	0.14		<0.5	3.0	<0.5	<0.5	<10.0	<u></u>	<0.5 <0.5	<0.5	.<0.5 <0.5	2.0
801 00100 0100 013000	NITTI	11/4/96	6.2	8.7	0.69		<0.5	2.0	<0.5	<0.5	<10.0					2.0
801 00100 0100 001001	NOSTRAND	10/30/96	6.5	3.9	0.20		<0.5	2.0	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	
801 00600 0100 003000	PEELING	11/18/90	6.2	7.3	<0.1		1.0	<0.5	16.0	<0.5	<10.0	<0.5	<0.5	0.8	<0.5	16.
801 00100 0100 009000	REGULINSKI	11/1/96	6.3	10.0	1.90	0.5	<0.5	4.0	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	4.0
801 00600 0100 006000	SAYRE	11/18/90	3 · 6.0	3.8	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	<0∶
801 00200 0100 006000	SCHAMBRA	11/4/96	6.3	3.4	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	<0 :
801 00600 0100 008008	SHEPHERD	9/9/96	5.8	2.7	<0.1	<0.5	<0.5	<0.5	. <0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	<0
801 00500 0100 021000	SHUTKA	8/27/96	6.1	7.4	0.33	3 <0.5	<0.5	<0.5	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	0.7	<0 .
801 00400 0100 017000	SHYBUNKO	9/30/96	6.9	8.9	<0 .1	0.8	2.0	0.8	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	4.7
801 00600 0200 025000	STARR	11/4/90	6.1	7.8	0.27	7 < 0.5	2.0	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	2.0
801 00300 0300 001003	VAN VECHTEN	11/4/96	6.9	8.6	<0.1	<0.5	<0.5	1.0	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	1.0
801 00600 0100 003005	VELIATH	10/7/96	6.6	5.8	<0 .1	1 <0.5	1.0	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	1.0
801 00200 0100 009000	WESE	11/4/90	6.1	4.2	<0.1	<0.5	<0.5	3.0	<0.5	<0.5	<10.0	<0.5	<0.5	<0.5	<0.5	3.0
801 00300 0200 00900	WILDZUNAS	10/7/96	5.3	<0.2	<0.	1 <0.5	<0.5	<0.5	<0.5	<0.5	66.0	<0.5	<0.5	<0.5	<0.5	<0
	te Drinking Water Standard	****	• NA	10 mg/	0.3 m	on 5 PPB	5 PPB	5 PPB	3 178	50 PT1	50 PPS	5 175	100 PFB	3 PPB	3 PPB	MA

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2	Tide Mill Rd	Saint James	0800 05200 0100 019000 -	0.6		0.7	9	3	2	2	_	.\
			0800 05200 0100 005000	1			1	5	1		↓	<u>.</u>
1 33,	7(10) 1(6)		801 00300 0300 001003									<u> </u>
 			<u> </u>					1				<u> </u>
10	Cermen I and	Saint James	<u> </u>					4.	0.5		J	 _
 ""	Outrion same		801 00200 0100 009000									
 			801 00300 0200 00900								J	
 	Fells Way	Head Of Harbor		0.7			0.5	4	2		1	<u> </u>
	19	2 Tide Mili Rd 337 River Rd 19 Carmen Lane 2 Fells Way	2 Tide Mill Rd Saint James 337 River Rd Saint James 19 Carmen Lane Saint James	337 River Rd Saint James 0800 05200 0100 005000 801 00300 0300 001003 801 00600 0100 003005 901 00600 0100 029000 801 00200 0100 009000 801 00300 0200 00900 801 00300 0200 00900	2 Tide Mili Rd Saint James 0800 05200 0100 019000 0.6 337 River Rd Saint James 0800 05200 0100 005000 1 801 00300 0300 001003 801 00600 0100 003005 19 Carmen Lane Saint James 0801 00600 0100 029000 801 00200 0100 009000 801 00300 0200 00900	2 Tide Mill Rd Saint James 0800 05200 0100 019000 0.6	2 Tide Mill Rd Saint James 0800 05200 0100 019000 0.6 0.7	2 Tide Mill Rd Saint James 0800 05200 0100 019000 0.6 0.7 9	2 Tide Mill Rd Saint James 0800 05200 0100 019000 0.6 0.7 9 3 3 3 3 7 8 7 8 8 8 8 8 8 8	2 Tide Mill Rd Saint James 0800 05200 0100 019000 0.6 0.7 9 3 2	2 Tide Mill Rd Saint James 0800 05200 0100 019000 0.6 0.7 9 3 2 2 2 337 River Rd Saint James 0800 05200 0100 005000 1 1 5 1 5 1 1 5 1 1	2 Tide Mill Rd Saint James 0800 05200 0100 019000 0.6 0.7 9 3 2 2

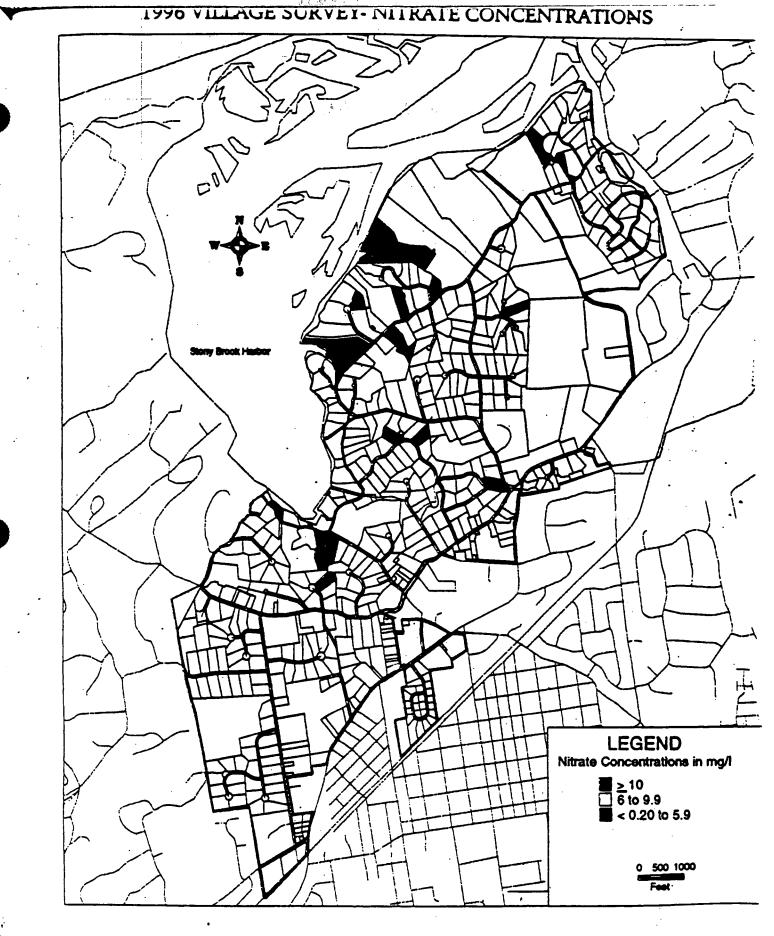
TABLE #3 SUMMARY of the VILLAGE of HEAD of the HARBOR VOCs SUB-SURVEY

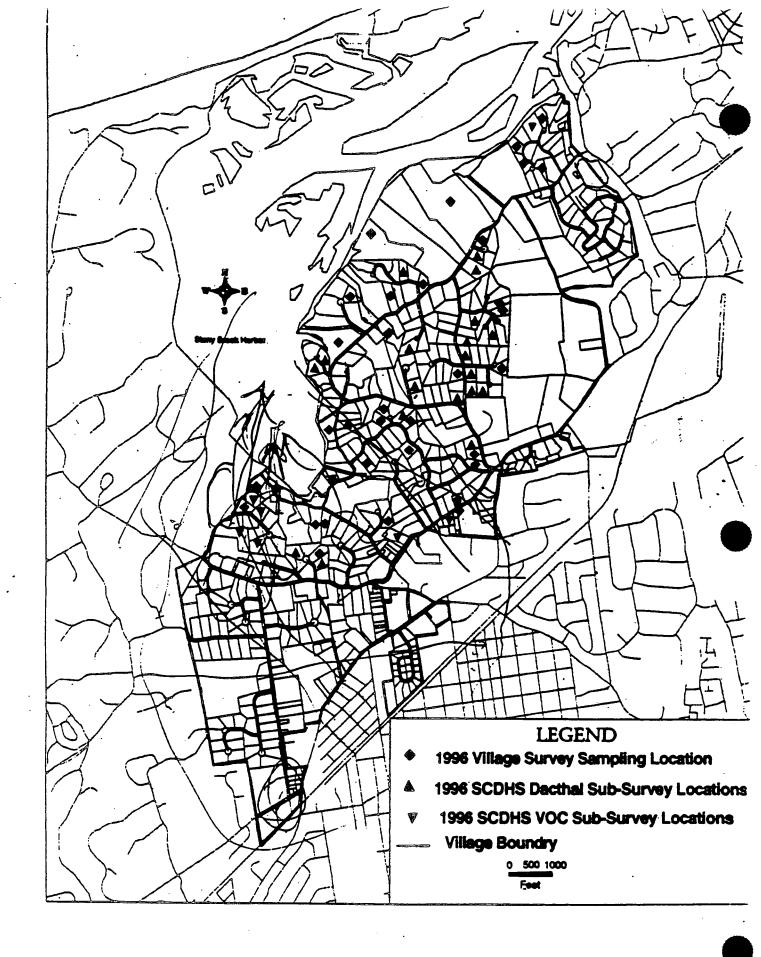
TAX MAP NUMBER	SAMPLE DATE	1,1- DICHLORO- ETHENE	1,1,1 TRICHLORO- ETHANE	TETRA- CHLORO- ETHENE	DICHLORO- ETHENE	EINENE	TOTAL VOCs
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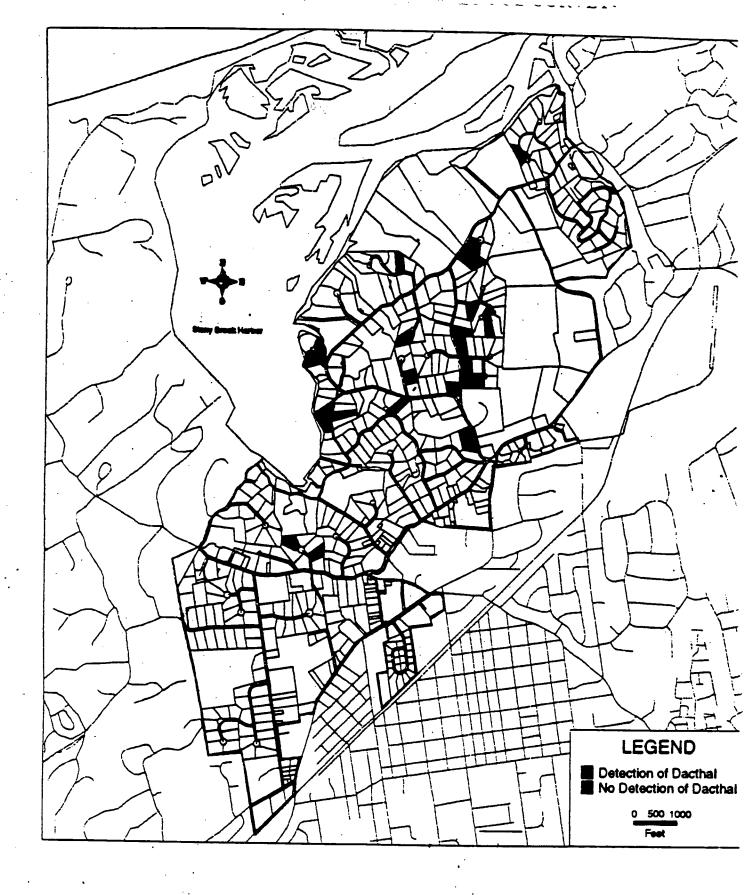
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REFERENCE NO. 4

REGION II SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

PROJECT NOTE

TO:

Smithtown Groundwater Contamination file

DATE:

30 June 1998

FROM:

Dennis J. Foerter, CHMM

SUBJECT:

June 29, 1998 Meeting with Suffolk County Department of Health Services

regarding Smithtown Groundwater Contamination site

On June 29, 1998, representatives of Region II START, U.S. EPA, and the Suffolk County Department of Health Services (SCDHS) met at the SCDHS office in Hauppauge, NY to discuss the Smithtown Groundwater Contamination site. During this meeting, analytical results and summary maps from the April 1998 EPA/Region II START tapwater sampling event were submitted to the SCDHS. In addition, the EPA On-Scene Coordinator explained EPA's intent to initiate a Removal Action which would supply bottled water to residents where PCE was detected above EPA's Removal Action Level (RAL) of 70 parts per billion (ppb). EPA also stated that they were going to offer treatment systems (granular activated carbon) to residents where PCE was detected at concentrations exceeding the State and Federal Maximum Contaminant Level (MCL) of 5 ppb. The EPA Site Assessment Manager also explained EPA's intent to prepare a Hazard Ranking System (HRS) Documentation package which would propose the site for National Priorities List (NPL) listing. The following issues pertinent to HRS scoring for the Smithtown Groundwater Contamination site were discussed:

- Mr. Sy Robbins, a geologist with SCDHS, stated that the private wells in the Smithtown Groundwater Contamination study area are all screened in Upper Glacial deposits; some of the deeper wells may be screened in the Magothy aquifer. There are some localized clay lenses in the area; however, the Upper Glacial and Magothy aquifers are interconnected and are not separated by a continuous confining layer.
- The SCDHS has investigated several facilities in the area (east of the site) in an effort to identify sources of the groundwater contamination. SCDHS also installed and sampled several monitoring wells in the areas of these facilities. Based on SCDHS's efforts to date, they have not been able to identify any source or sources of this contamination.

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REFERENCE NO. 5

UNITED STATES DEPARTMENT OF THE INTERIOR STEWART L. UDALL, Secretary

GEOLOGICAL SURVEY

Thomas B. Nolan, Director

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CONTRIBUTIONS TO THE HYDROLOGY OF THE UNITED STATES

HYDROGEOLOGY OF THE HUNTINGTON-SMITHTOWN AREA, SUFFOLK COUNTY, NEW YORK

By E. R. LUBKE

ABSTRACT

This report presents the results of an investigation of the ground-water resources and related geologic environment of the Huntington-Smithtown area, New York, by the U.S. Geological Survey in cooperation with the Suffolk County Board of Supervisors, the Suffolk County Water Authority, and the New York State Water Resources Commission. Fieldwork on the investigation, which is part of an overall program for the continuing appraisal of the ground-water reservoir of Long Island, N.Y., was carried on between November 1957 and May 1959.

The Huntington-Smithtown area contains about 153 square miles in northwestern Suffolk County, and the population in 1958 was estimated to be 153,000. The area is in north-central Long Island, which is the partly submerged northeastern extension of the Atlantic Coastal Plain. The chief physiographic features, which are largely of glacial origin, include a belt of headlands and bays along the margin of Long Island Sound, the Harbor Hill end moraine, an intermorainal belt, the Ronkonkoma terminal moraine and related clusters of hills, and a south-sloping glacial outwash plain. All the larger streams, such as the Nissequogue River, Cold Spring Brook, Sunken Meadow Creek, Stony Hollow Run, and Mill Creek, are perennial and are characterized by markedly uniform flow sustained by ground-water discharge. The total runoff of these streams has averaged about 11 billion gallons a year during the period of record. The climate is temperate humid with an annual average precipitation of 49 inches. Since World War II, a large growth in population has taken place in the report area, which is suburban to New York City. Concurrently, many new homes have been constructed and light industries have been established. Agriculture, formerly a major activity, is on the wane with the inroads of suburban development on farmed acreage. In 1960, less than 1,800 acres was farmed.

The Huntington-Smithtown area is underlain by 400 to 1,300 feet of unconsolidated deposits of Cretaceous and Quaternary age resting upon a south-cast-sloping bedrock surface. These deposits constitute the ground-water reservoir. Three distinct aquifers have been recognized in the ground-water reservoir. These are: (1) a shallow aquifer, which mainly includes permeable upper Pleistocene deposits, the Magothy(?) formation, and possibly some Pliocene deposits; it lies between the water table and about 50 to 80 feet below sea level and contains water generally under unconfined conditions,

(2) an intermediate aquifer, which extends from about 60 to 100 feet below sea level to 850 feet below sea level in the Pleistocene deposits and in the Magothy (?) formation and which contains water under confined conditions, (3) a deep aquifer, which is mainly composed of the Lloyd sand member of the Raritan formation and which contains water under confined conditions. In 1957, approximately 53 percent of the gross pumpage was from Pleistocene deposits, 44 percent from the Magothy (?) formation, and 3 percent from the Lloyd sand member.

Lloyd sand member.

The average natural recharge to the ground-water reservoir in the Huntington-Smithtown area is estimated to be 147 mgd (million gallons per day).

This is equivalent to an average of about 43 percent of the average annual precipitation (49 inches) or 21 inches of water. The remainder of the preprecipitation is returned to the atmosphere by evapotranspiration or is lost to the sea by overland runoff.

In general, ground-water supplies in substantial quantity and of good quality can be obtained from wells almost everywhere in the project area, except locally on Lloyd and Eaton Necks. Between 1932 and 1957, average withdrawals for public supply increased from 1.5 mgd in 1932 to 8.8 mgd in 1957. In addition, about 5.9 mgd was used in 1957 for industrial, institutional, domestic, and agricultural purposes.

On Lloyd and Eatons Necks, potentialities for ground-water development are limited by a reduced thickness of the ground-water reservoir and the nearness of salt-water bodies, which pose the ever-present threat of contamination. In this regard, Eatons Neck is particularly vulnerable, as salty ground water occurs at varying depth around much of its shoreline. Apparently fresh water in the interior part of Eatons Neck occurs only in the upper ently fresh water in the interior part of the Magothy(?) formation—Pleistocene deposits and in the upper part of the Magothy(?) formation—probably as a fresh-water lens floating on denser salty water. On the other hand, on Lloyd Neck the ground-water reservoir appears to contain fresh water from the water table to bedrock, except in some marginal parts of the peninsula.

In the main part of the report area, the chief centers of moderately heavy withdrawal from wells are near the southern extremities of Cold Spring and Huntington Harbors, and near Centerport and Northport Harbors. Withdrawals from these centers, exceeding those in 1960, may result in local contamination from nearby bodies of salt water. The 1960 draft on the ground-water reservoir in the central and southern parts of both Huntington and Smithtown is relatively light. Consequently, these parts would be optimum for new ground-water development. Generally, it would be desirable to locate new wells and well fields at least 2 miles inland from tidewater and a mile from existing installations of moderately heavy withdrawal to lessen the effect of mutual interference between pumping wells.

Contamination of the ground-water reservoir by synthetic detergents and domestic waste was not a problem of large magnitude in the project area in 1960, but it may intensify in the future if adequate countermeasures are not undertaken. Partial solutions to the problem include: (1) encouragement of the development and marketing of degradable detergents, (2) limiting industrial and residential development in specific zones to protect future public water-supply installations, (3) withdrawal of water supplies from wells in the deeper part of the Magothy(?) formation, particularly where population and industry are relatively dense, and (4) construction of sanitary sewer systems in present and potential areas of high population density.

INTRODUCTION

SCOPE AND PURPOSE OF INVESTIGATION

The present report on the ground-water resources and related geologic environment of the Huntington-Smithtown area is part of an overall program for the continung appraisal of the ground-water reservoir on Long Island. This program, begun in 1932, has been carried on by the U.S. Geological Survey in cooperation with the New York State Water Resources Commission (formerly New York State Water Power and Control Commission), the Nassau County Department of Public Works, the Suffolk County Water Authority, and the Suffolk County Board of Supervisors. Fieldwork on the present investigation was started by the author during November 1957 and continued through May 1959.

The purpose of the work was as follows: To determine the thickness and areal extent of water-bearing formations, to define the nature and direction of ground-water movement, to evaluate the hydraulic properties of the water-bearing materials, to determine replenishment and withdrawals for appraising the optimum location of potential centers of withdrawal from the ground-water reservoir, and to appraise the chemical character of the ground water with respect to its general use and to sea-water encroachment and contamination by domestic and industrial wastes.

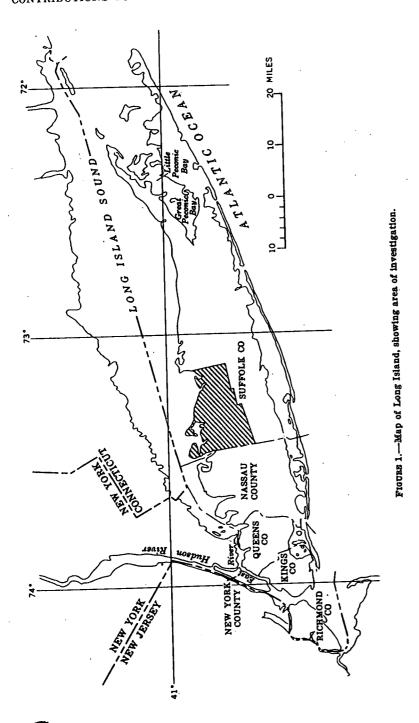
LOCATION AND EXTENT OF AREA

The area of investigation comprises the Town of Huntington and the adjacent Town of Smithtown in northwestern Suffolk County, Long Island, N.Y. (fig. 1). The Town of Huntington (also called Huntington in this report) makes up the western part of the project area, and the Town of Smithtown (also called Smithtown in this report) makes up the eastern part. Both towns have villages bearing the same name. Where the village is referred to, the full name is given—for example, village of Huntington.

The east-west length of the project area is about 20 miles, and the north-south width ranges from 7 to 12 miles. The land area is approximately 153 square miles. It is bordered on the north by Long Island Sound, on the west by Nassau County, on the east by the Town of Brookhaven, and on the south by the Towns of Babylon and Islip. The western limit is about 30 miles east of Manhattan (New York County), New York City.

PREVIOUS INVESTIGATIONS

Many ground-water and geologic studies, mostly of small scope have been made of Long Island, but the earliest and most compre-



hensive areal ground-water investigation was made by Veatch and others (1906). Subsequent studies, primarily geologic, were made by Fuller (1914) and by Suter, de Laguna, and Perlmutter (1949). Horace R. Blank (written communication, 1928) studied the groundwater and geology of the Smithtown area. The New York State Water Resources Commission in cooperation with the U.S. Geological Survey has published three bulletins, GW-4 (U.S. Geol. Survey, 1938), GW-9 (Roberts and Brashears, 1945), and GW-31 (New York State Water Power Control Comm., 1952), in which well logs and related hydrologic data have been compiled for Suffolk County. Additional contributions to the geology have been made by other investigators, including Thompson, Wells, and Blank (1937) and Fleming (1935). The surficial geology of the Huntington-Smithtown area was originally mapped by Fuller (1914), whose interpretation was similar to the one given in this report. More recently, Wiggin (1957) evaluated the need for the development and distribution of the available water supply of Suffolk County, Long Island. In his conclusions, Wiggin pointed up the need for more specific analysis and interpretation of the geology and hydrology of Suffolk County, particularly with reference to the future development and use of the county's water resources.

ACKNOWLEDGMENTS

The assistance of many individuals and agencies has greatly facilitated the progress of this investigation. The author wishes to express his thanks for the help given by numerous well drillers and public and private water-supply officials. The New York State Water Resources Commission, the Suffolk County Water Authority, and Suffolk County officials supplied essential basic information. The officials of the Northport Veterans Hospital and the Kings Park State Hospital also were very cooperative in supplying hydrologic data. Many private individuals generously gave permission to use their wells for observation. The report was prepared under the supervision of G. C. Taylor, Jr., formerly District Geologist, and N. M. Perlmutter, geologist-in-charge, Mineola subdistrict office.

WELL-NUMBERING SYSTEM

Wells drilled in Long Island are assigned serial numbers by the New York State Water Resources Commission, Westbury, N.Y., and logs and related hydrologic data for these wells are retained by the same agency. Well numbers are prefixed by a capital letter designating the county in which they are located. For example, S indicates wells in Suffolk County; N, wells in Nassau County. For

convenience in this report, however, the prefixes have been omitted from the number of wells plotted on plates 1 and 5. The map coordinates by which individual wells may be approximately located in plate 1 are given in table 7. Geologic and hydrologic data for wells shown on plate 1 but not published in this report are available for consultation in the files of the Geologic Survey office at Mineola, N.Y., and the New York State Water Resources Commission at Westbury, N.Y.

GEOGRAPHY

PHYSIOGRAPHY AND DRAINAGE

The Huntington-Smithtown area is in north-central Long Island, which is the partly submerged northeastern extension of the Atlantic Coastal Plain. The physiographic features, which are largely of glacial origin, may be grouped into five morphologic units from north to south: (1) the headlands and bays along the margin of Long Island Sound; (2) the Harbor Hill end moraine, (3) an intermorainal belt, (4) the Ronkonkoma terminal moraine with contiguous clusters of hills, and (5) a southward-sloping glacial outwash

plain.

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Two prominent headlands, Lloyd Neck and Eatons Neck, tied by low sand and gravel bars to the mainland, rise abruptly from Long Island Sound to uniform altitudes of about 100 feet. Between these headlands lies Huntington Bay, whose shoreline is broken by several smaller indentations including Lloyd, Huntington, Centerport, Northport and Duck Island Harbors, and Northport Bay. East of Lloyd Neck is Cold Spring Harbor, and north of Smithtown is the broad indentation of Smithtown Bay, whose shoreline is notched by the Nissequogue River estuary and Stony Brook Harbor. Lying south of the headlands and the heads of the bays and harbors is the irregular, discontinuous ridge of the Harbor Hill end moraine, which trends east-northeast across the entire area. This ridge reaches summit altitudes generally ranging from 250 to 300 feet and is breached in several places by the valleys of streams draining north to Long Island Sound. South of the Harbor Hill terminal moraine is an intermorainal belt lying at altitudes of between 160 and 200 feet; the belt is about 1 to 4 miles wide and is slightly dissected by shallow north-flowing streams. The broad valley of the Nissequogue River, the largest stream in the project area, is in this belt.

The Ronkonkoma terminal moraine also forms an irregular ridge lying to the south of the intermorainal belt and trending west across Huntington and through southwestern Smithtown. The summit altitudes on this ridge range from about 340 to 380 feet, and the ridge is breached in three places by broad-floored gaps at altitudes of 140 to 160 feet marking the former spillways of south-flowing

glacial melt water streams. In central and southern Huntington the east-west alinement of the ridge is broken by the West and Half Hollow Hills, which extend south to the town boundary. South of the Ronkonkoma moraine and the contiguous hills and abutting these on the north at altitudes of about 80 to 100 feet is an outwash plain, which slopes uniformly south at about 20 feet to the mile to the Atlantic Ocean.

Several streams, discharging into Long Island Sound, flow through the area and generally lie in north-trending valleys. The Nissequogue River is the largest stream, and its drainage basin, which is almost entirely in Smithtown, includes about 26 square miles. This stream ends in a relatively large estuary, which extends 2 to 3 miles inland. Other smaller streams are Mill Creek, Stony Hollow Run, Sunken Meadow Creek, and Cold Spring Brook draining a part of Nassau County. Most of these streams are in the town of Huntington. The southeast corner of Smithtown borders on Lake Ronkonkoma, the largest natural lake on Long Island. This lake originated as a glacial kettle; its bottom intersects the water table and normally does not overflow.

CULTURE

Since World War II the population and industry of the entire Huntington-Smithtown area have grown rapidly, but the growth has been most pronounced in Huntington (fig 2). The population in 1958 for the project area was estimated to be 153,000, based on a survey made by the Long Island Lighting Co. A continuing growth in population is indicated by the present (1960) construction of new homes through much of the area. Concurrent with the population increase is the growth of light industries, most of which make electronic equipment.

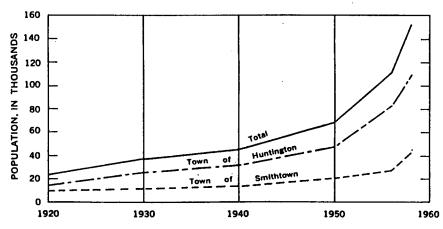


FIGURE 2.-Population trends in the Huntington-Smithtown area.

Agriculture is still practiced, but the large-scale construction of private dwellings has made marked inroads into the total farmed acreage. The decrease in farmed acreage is well demonstrated in Smithtown, where more than 4,000 acres devoted to agriculture in 1945 were reduced to about 1,800 acres in 1958. As elsewhere in central and eastern Long Island potatoes are the major agricultural crop. In addition, garden vegetables, cauliflower, wheat, and rye are also grown extensively for local and national markets.

CLIMATE

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The climate of the Huntington-Smithtown area is relatively mild with extremes of temperature moderated considerably by the ocean. The average annual temperature is about 52°F. The average minimum and maximum monthly temperature of 31°F and 73°F occur during January and July, respectively. The average annual precipitation is about 49 inches, and is distributed relatively evenly throughout the year. A minimum and maximum annual precipitation of 36.4 inches (1957) and 69.2 inches (1898), have been recorded at the rain-gaging station in Brentwood, about 9 miles southwest of the village of Smithtown. The minimum monthly precipitation occurs generally in June and the maximum in August.

Precipitation and temperature data are available for six stations in the Huntington-Smithtown area and its immediate vicinity. Precipitation data for these stations are summarized in table 1. The length of record available for each station ranges from 7 to 31 years. Records of precipitation in Brentwood were maintained from 1891 to 1900 and then continuously since 1941. The average annual precipitation recorded for each station listed in table 1 ranges from 45.9 inches at Farmingdale, about 11 miles southwest of Huntington, to 56.2 inches at Lake Ronkonkoma. In the project area a minimum monthly rainfall of less than 0.01 inch has been observed during June, and a maximum of 14.4 inches during October.

TABLE 1.—Summary of average monthly and annual precipitation at stations in or adjacent to the Huntington-Smithtown area

Record Period of record Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. precipitation							A ver-								
Station Period of record Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. precipitation Babylon		Average monthly precipitation							age						
Babylon	Station	Period of record	Jan.	Feb.	Mer.	Apr.	Мву	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	precip- itation
konkoma. 1963-59 2.86 8.27 4.96 4.27 3.35 2.02 2.98 5.32 3.84 5.09 4.76 4.16 48	Farmingdale Huntington Station. Lake konkoma.	1891-1900, 1941-58. 1921-34, 1940-56. 1953-59	3. 17 3. 11 5. 01	3. 41 3. 18 3. 43 4. 53	4. 48 4. 15 4. 85 5. 86	3.72 3.78 4.22 4.7	3.96 3.77 9.5.3	2. 62 3. 86 7 1. 46 5 2. 9	3 3.86 3 2.84 9 3.4	5. 18 5. 99 3. 5. 5	2.73 3.36 3.96 8.4	3.55 4.86 1 4.4	4. 25 4. 55 4. 5. 1	3. 91 3. 56 4. 06 7 5. 66	46. 79 45. 91 47. 04 56. 24

GEOLOGIC FORMATIONS AND THEIR WATER-BEARING CHARACTER

GENERAL FEATURES

The Huntington-Smithtown area is underlain by 400 to 1,300 feet of unconsolidated deposits of Cretaceous, Tertiary (?), and Quaternary age resting upon a surface of southeast-sloping bedrock. The bedrock is probably of igneous and metamorphic origin and of Precambrian to early Paleozoic age, as in other parts of Long Island. Deposits of Late Cretaceous age rest unconformably upon the bedrock surface. A summary of the stratigraphic sequence in the Huntington-Smithtown area is given in table 2.

The Raritan formation of Late Cretaceous age is the oldest unconsolidated deposit. This formation is divided into a basal Lloyd sand member and an upper clay member, which is generally overlain by the Magothy(?) formation, also of Late Cretaceous age. Pliocene(?) deposits (Suter and others, 1949, footnote p. 9) are represented by the Mannetto gravel, remnants of which lie on the Magothy(?) formation chiefly in the Mannetto Hills of eastern Nassau County and in the West Hills of the Town of Huntington.

Deposits of Pleistocene age belonging to one or more glacial stages and one interglacial stage have been recognized in Long Island, but not all these have been identified in the Huntington-Smithtown area. The Jameco gravel, an early glacial-outwash deposit of pre-Wisconsin age, is widely distributed in western Long Island where it is recognized entirely in well logs (Suter and others. 1949, pl. 20). It may also be present in some of the deeper buried valleys of the Huntington-Smithtown area but has not been positively identified. An interglacial shallow marine deposit, the Gardiners clay, has been recognized in western and central Long Island. (See Suter and others, 1949, pls. 17 and 21, and Weiss, 1954.) This formation, also of pre-Wisconsin age, was deposited around the margins of Long Island when sea level was about 50 feet lower than it is now. The Gardiners or its nonmarine equivalent may be present in some deep buried valleys of the project area, but it has not been recognized separately in well logs because of its lithologic similarity to younger clay of probable glaciolacustrine origin. Glacial deposits of the Wisconsin stage, also termed upper Pleistocene deposits in this report, constitute the bulk of the Pleistocene sequence. These deposits generally rest directly on the deposits of Cretaceous age and locally on the Mannetto gravel of Pliocene (?) age or on undifferentiated deposits of Pleistocene age.

The glacial origin of the surficial Pleistocene deposits is indicated by two morainal ridges, which traverse the length of the project area (pl. 2). The Ronkonkoma terminal moraine in the south marks the maximum advance and its northern counterpart, the Harbor Hill end moraine, mark a second position of an ice sheet, which covered much of Long Island during the Wisconsin glacial stage. In the Huntington-Smithtown area the stratification and morphology of the deposits in these ridges indicate that they are chiefly coalescing kame-type structures formed along a relatively stationary ice front. In Huntington the Ronkonkoma moraine lies on the northern fringe of the West Hills and rests on the Mannetto gravel. A surficial till sheet attaining a thickness generally no greater than about 10 feet is common on upland surfaces of the project area north of the Harbor Hill moraine. Surficial deposits of sand and gravel, laid down by melt-water streams issuing from the ice front, form a pitted outwash plain in the intermorainal belt between the ridges formed by the Harbor Hill and Ronkonkoma moraines and a relatively smooth south-sloping outwash plain south of the Ronkonkoma moraine.

Deposits of Recent age are thin and are limited chiefly to shoreline

areas.

BEDROCK

The lower limit of the ground-water reservoir in the Huntington-Smithtown area is marked by an erosional surface on a complex of igneous and metamorphic rocks, which are of Precambrian and possibly early Paleozoic age. The bedrock underlying Long Island is composed chiefly of granite, diorite, gneiss, and schist.

Evidence of the nature of the bedrock in the Huntington-Smithtown area is available only from two wells, S34 (U.S. Geol. Survey, 1938, p. 25) and N3355 (pl. 4). Well S34 (pl. 4) on Duck Island southeast of Eatons Neck is reported to have penetrated bedrock at 602 feet below land surface (597 ft below sea level). The driller's report described the bedrock as a "sandstone." If this description is correct, this occurrence would be the only sandstone bedrock recorded in Long Island. It is likely however, that the driller's description is in error and that the material described as "sandstone" is actually weathered igneous or metamorphic rock. Weathered bedrock, 1,218 feet below the land surface (1,035 ft below sea level), also was penetrated in well N3355 situated in Nassau County near the western limit of the project area. The general composition of the weathered material at this site suggests igneous and metamorphic parent rocks, which are common in other parts of Long Island.

The weathered zone above the fresh rock is regarded as lateritic and probably formed immediately prior to the deposition of the Cre-

taceous sediments. The weathered zone is generally composed of variegated clay containing partly decomposed fragments of bedrock. It ranges in thickness from 5 to 100 feet (Suter and others, 1949, p. 13).

The bedrock surface, striking east-northeast, is a relatively smooth plane which slopes at about 80 feet per mile southeastward across the Huntington-Smithtown area (Suter and others, 1949, pl. 8). This surface ranges from about 400 feet below sea level in the northwestern part of the project area to about 1,300 feet below sea level in the vicinity of Lake Ronkonkoma. Owing to the low permeability, the water-yielding potential of the bedrock is poor in comparison with that of the overlying unconsolidated deposits. Consequently, the bedrock is not considered to be a source of ground water.

UPPER CRETACEOUS SERIES

In the Huntington-Smithtown area, as elsewhere on Long Island, deposits of Late Cretaceous age are divided into two formations, the Raritan formation and the overlying Magothy (?) formation, which is in part equivalent to the Magothy formation of New Jersey. This sequence of deposits is composed of interbedded layers of sand, gravel, silt, and clay that dip gently to the southeast subparallel to the slope of the underlying bedrock surface. The Raritan and Magothy (?) formations were probably deposited largely by sluggish streams in a low swampy coastal-plain environment. However, marine facies may be present, at least locally, in these deposits, if one report of fossils is correct. According to Veatch and Bowman (1906, p. 297), a crinoid stem and a bryozoan were found in samples taken from a depth of 247 feet in well S230 (pl. 4). These marine fossils in the Lloyd sand member of the Raritan formation are considered to be of Late Cretaceous age. Marine beds, possibly correlative with the Monmouth Group, also have been identified in the upper part of the Magothy (?) formation in southwestern Suffolk County (Perlmutter and Crandell, 1959, p. 1066). The Cretaceous deposits generally increase in thickness southeastward. The deposits, however, were deeply dissected by stream erosion during Tertiary and probably early Pleistocene time and the resulting erosional surface on the Cretaceous in the project area has relief which in places exceeds 500 feet (pl. 3). This surface was subsequently buried by Pleistocene glacial and marine deposits, although the Cretaceous is covered by younger deposits in virtually the entire project area, small outcrops occur near sea level in bluffs and along the beaches on the north shore of Lloyd Neck, on the west side of Eatons Neck, and on the east side of Cold Spring Harbor (pl. 3). One small outcrop also was observed in an excavation in the West Hills at an altitude of 250 feet (pl. 3). The geologic relations of the Cretaceous and younger deposits are shown in plate 4.

RARITAN FORMATION

The Raritan formation probably is present throughout the Huntington-Smithtown area according to available well logs. The upper surface of the Raritan, which also is the upper surface of the clay member, slopes southeastward. It has considerable relief in the northern part of the area. This relief is the result of post-Cretanorthern part of the area. This relief is the result of post-Cretanorthern part of the upper surface of the clay member is about 100 feet below sea level in the northwestern part of Lloyd Neck (pl. 4) and is about 700 feet below sea level in the vicinity of Lake Ronkonkoma (pl. 4). In the same localities the top of the Lloyd sand member ranges from 200 to 850 feet below sea level. Approximate contours on the surface of the Lloyd sand member and of the clay member are given in Suter and others (1949, pls. 11, 12, 14, and 15). Depths to the top of these surfaces also are shown in the geologic sections (pl. 4).

The Lloyd sand member rests unconformably on bedrock in most of the area, and has been penetrated completely by test well N3355 of the area, and has been penetrated completely by test well N3355 (pl. 4), which is in Nassau County just west of the project area. At (pl. 4), which is in Nassau County just west of the project area. At (pl. 4), which is in Nassau County just west of the project area. At (pl. 4), which is in Nassau County just west of the Huntingthis site the total thickness of the Lloyd presumably is penetrated entirely by ton-Smithtown area the Lloyd presumably is penetrated entirely by well S34, but no log is available. Several other wells (S9, S217, S230, and S4467, pl. 4) have been drilled 50 to 120 feet into the Lloyd. The logs of these wells suggest that the Lloyd consists chiefly of lenses of fine to coarse sand and gravel but that it contains clay and silt as thin layers or as intergranular fillings. The color of the Lloyd sand member is generally white and gray, but in a few places it is pale yellow.

The clay member of the Raritan, which overlies the Lloyd sand member, is composed chiefly of beds of variegated clay and silt, which contain interbedded layers of sand in some places. Lignite in dispersed fragmental form and iron oxide and pyrite nodules are also common. The clay member ranges in thickness from 0 to 188 feet and averages about 170 feet. In general, well logs indicate that the thickness and physical character of the clay member are relatively uniform throughout the Huntington-Smithtown area (pl. 4).

The clay member of the Raritan generally consists of material of relatively low permeability and acts as an aquiclude, which confines water in the underlying Lloyd and retards interchange of water with overlying Magothy (?) formation.

The Lloyd sand member is a significant source of water in Queens and Nassau Counties, where wells may yield as much as 1,600 gpm (gallons per minute). The Lloyd has not been developed extensively in Suffolk County. Several domestic and public-supply wells are screened in the Lloyd in the northern part of the Town of Huntington. The record of a typical well tapping the Lloyd is given in table 1. Because of the lack of data, it is not possible to estimate directly the hydraulic properties of the Lloyd sand member in the Huntington-Smithtown area. Swarzenski (1961, p. 27), however, has made estimates indicating that the coefficient of permeability (Wenzel and Fishel, 1942, p. 7) of the water-bearing zones in the Lloyd sand member in northwestern Nassau County may range from 200 to 600 gpd (gallons per day) per sq ft. Comparable coefficients of permeability also may be expected in the project area. In 1957, pumpage from the Lloyd sand member accounted for only about 3 percent of the total pumpage for public supply and industrial use in the Huntington-Smithtown area.

MAGOTHY(?) FORMATION

The Magothy (?) formation rests on the top of the Raritan formation and underlies most of the Huntington-Smithtown area. The upper limit of the Magothy (?) is marked by a highly irregular erosional surface (pl. 3), upon which rest deposits of Pleistocene and in some places Pliocene (?) age. The maximum relief on this surface is greater than 500 feet. This surface on the Magothy (?) formation has a maximum known altitude of about 250 feet in the West Hills area, but in several areas it lies 200 feet or more below sea level. The Magothy (?) formation is as much as 800 feet below sea level near the southern limit of the Huntington-Smithtown area, but data from well logs and samples suggest that in several places the formation is missing, as for example, in the Huntington buried valley (pl. 4).

The upper part of the Magothy (?) formation is composed mostly of layers of fine to medium quartz sand, generally somewhat clayey and interbedded with layers of clay and silt. (See the following well logs.) Gravelly layers, which occur in a few places, appear to be lenticular and have relatively small areal extent. Colors range through white, gray, brown, yellow, and red, but the sandy layers generally have a somewhat lighter color owing to the presence of intergranular fillings of white clay. Lignite in fragmental form and pyrite and iron oxide nodules are commonly dispersed throughout the formation.

S15923. (10E)

[Indian Head Water Co., Indian Head Rd., Indian Head, N.Y. Drilled in 1958 by C. W. Lauman and Co., Inc. Casing diameter 16 in., screen settings from 148 to 165 ft, 189 to 229 ft, and 253 to 263 ft. Alt 130 ft. Log based on examination of core samples]

Recent deposits:	_	
Top soil and loam	2	2
Jpper Pleistocene deposits:		
Sand, coarse, and gravel; brown	30	32
Sand, coarse, and gravel; some clay; brown	10	42
Sand, coarse, and gravel; brown	62	104
Sand, fine, brownSand, coarse to very coarse, gravelly, yellowish-brown	.5	109
Sand, coarse to very coarse, gravelly, yellowish-brown	11	120
Agothy(?) formation:	ا م	100
Sand, fine to coarse, light-brown; some lumps of white clay	9	129
Sand, very fine to medium, clayey; white	6	135
Clay interbedged with the sand and sit; laminar bedging	4	139
Sand, very fine to fine, whitish-gray	5	144
Sand, medium, yellowish-brown	6	150
Sand, medium to coarse, light-brown	5	155
Sand, medium to coarse, light-brown; some clay	9	164
Sand, medium to coarse, buff	6	170
Clay interpedded with sut, buil, grayish-brown; laminar		175
bedding	5 5	175 180
Clay, dark-gray laminated, ligniticSand, fine to medium, clayey, whitish-brown	4	184
Sand, and to medium, ciayey, wantish-brown	11	195
Sand, fine to medium, buff	15	200
Sand, inediant to coarse, buil and red; some winte day	5	205
Sand, fine to medium Sand, medium, light-gray and reddish-brown; few fragments	١٣	200
of cemented red sandstone	6	211
Sand, medium, reddish-brown	. š	216
Sand, medium, reddish-brown; some layers of clay	4	220
Sand, fine to medium, buff; some lignite and few limonitic	*	220
concretions.	5	225
Sand, fine to medium, buff and light-gray; some clay lumps	6	231
Sand very fine claves whitish-grey	šΙ	234
Sand, very fine, clayey, whitish-graySand, very fine to medium, clayey, whitish-gray and buff	3 5	239
Clay, silty, light-gray	6	245
Sand, very fine, clayey, whitish-brown	šl	250
Sand, fine to medium, clayey, whitish-gray and buff; some	٠,	
limonitic concretions	13	263
Sand, fine, clayey, buff; some white clay layers	5	268
Sand, fine, whitish-gray; interbedded with clay and silt;	٦	
laminar hedding	6	274
laminar bedding Sand, very fine, whitish-gray and whitish-brown; interbedded	٦,	
with clayey silt	11	285
Sand, fine to medium, clayey, whitish-brown	5	290
Sand, fine, clayey, whitish-brown	5	295
Sand, fine to medium, clayey, light-brown	15	310
Sand, fine claver whitish-brown	iŏ	320
Sand, fine, clayey, whitish-brown Silt interbedded with very fine sand and lignite, gray; some		
concretions of pyrite	14	334
Sand, fine to medium, clavey, whitish-brown	ii l	345
Sand, fine to medium, clayey, whitish-brownSand, very fine to medium, clayey, buff, whitish-gray	- 5	350
Silt, clayey, whitish-gray; some lignite	4	354
Clay, brown and gray Clay, silty, gray; some lignite	6	360
Class alless are limited	ž	362

Thick- ness (feet)	Depth (feet)
	(1961)

S15899-T. (10E)

[Suffolk County Water Authority, Carlson Ave., Kings Park, N.Y. Drilled in 1957 by C. W. Lauman and Co., Inc. Test well. Alt 170 ft. Log based on examination of core samples]

and Co., Inc. Test well. All 110 to	1	
Recent deposits:	2	2
	00	62
Upper Pleistocene deposits: Sand, coarse, and gravel; brown	60	128
Sand, coarse, and gravel; brown	66	140
Sand, coarse, gravel, and cobbles; brown	12	148
Sand, coarse, gravel, boulders, and clay lumps, Sand, coarse, gravel, and boulders; brown	8	168
Sand, coarse, gravel, and boulders; brown	20	179
Sand, coarse, cobbles, and ciay lumps, blown	11	119
Sand, coarse, coarse graver,	1	
Magothy(?) formation: Sand, fine to medium, light-brown and gray; contains some		200
thin layers of white clay	141	320
thin layers of white clay	5	325
Silt, clayey, white-gray, middle whitish-gray and yellowish-	1	054
Sand, medium to coarse, clayey, whitish-gray and your brown	29	354
Drown	11	365
brownClay, buffClay, gray; some ligniteClay, gray; some lignite	15	380
Clay, gray; some figure	9	389
Clay, gray; some lignite_ Clay, silty, light-gray and light-brown_ Sand, fine to medium, clayey, light-gray and yellowish-brown,	1	
Sand, fine to medium, clayey, henvelope	7	396
micaceous micaceous scattered	1	
Sand, fine to coarse, yellowish-blown, microsom,	56	452
layers of gray clay	3	455
Sand, very nne, clayey, whitisher and a series of the seri	14	469
Sand, fine to medium, light-brown	6	475
Sand, medium to very coarse, four layers of clay	13	488
Sand and diayey sitt, light-brown	6	494
Sand, fine to medium, and some glave light brown	25	519
Sand, fine to medium, and some gravel; light brownSand, fine to coarse, gravelly, and some clay; light brownSand, fine to coarse, and some gravel; few clay layers;		
Sand, medium to coarse, and	20	539
light brown	7	546
Sand, medium to coarse, gravelly, light brown-	16	562
Sand, medium to coarse, graveny, inglive of water Sand, medium to coarse, clayey, and some gravel; light brown-	3	565
Sand, fine to coarse, clayey, light-gray	15	580
Sand, medium to coarse, clayey, and some graver, agno- Sand, fine to coarse, clayey, light-gray	13	593
Sand, medium to coarse, light brownSand, medium to coarse, light brown	7	600
Sand, medium to coarse, light brown Sand, fine to coarse, gravelly and clayey, light-brown Sand, fine to coarse, gravelly and clayey, light-gray; some limonitic con-		ì
Sand, fine to medium, clayey, new early, and	11	611
cretions Sand, medium to coarse, clayey, and some gravel; light-brown	1	Į.
Sand, medium to coarse, clayey, and some graver, light-brown	15	626
and light-gray		636
and light-graySand, fine, clayey, whitish-brown; few layers of clay	18	654
Sand, fine, clayey, whitish-brown; few layers of clay Sand, fine to coarse and gravel, clayey		
Raritan formation:	1	1
Clay member:	39	693
Grandle alayor light-gray, micaceous		1
Sand. very line, clayey, here bear, it is a sand wal-	1	
Clay member: Sand, very fine, clayey, light-gray, micaceous Sand, fine, clayey, light-gray, reddish-brown, and yel-	7	700
Sand, very fine, clayey, light-gray, incaceous Sand, fine, clayey, light-gray, reddish-brown, and yellowish-brown. Silt, clayey, light-gray	- 7 6	700 706

ystem Series	-		ABLE 2.—	
ystem Series Strategickers (feet)	are Howards milt		Summary of the stratt	
(teet)	Thickness		дгарку ин	
	Character of deposits		County, N.Y.	ander-hearing properties of the deposits under
loan blob - Tourist amail		Water-bearing properties		and enter-hearing properties of the deposits underlying the Huntington-Smithtown area, Suffolk

Precambrian to lower Paleozoic		Oretac	eous			Terti	ary(?)		Quaternary	·		ystam
Paleozoic .	ש	pper Cr	etaceous	-		Plioc	ene(7)		Pleistocene	Rec	1.	Series
Bedrock	Lloyd sand member	Clay member		-	Magothy(?) formation	Unconformity	Mannetto gravel	Unconformity? Pleistocene deposits un- differentiated.	Upper Fielstocene depositu.	beach deposits, and sur- ficial soil.	Recent deposits Artificial fill, marsh deposits,	Stratigraphic unit
	200-265士	0(°)−188±	· ·				0-300±	0-400±-	- 200-1			Thickness (feet)
Crystalline metamorphic and Igneous rocks.	Sand, fine to coarse, and gravel, mixed with some clay and some layers of silt and clay. Colors are white to pale yellow.	Clay and slit, and a few layers of sand. Lignite and pyrite concretions are common. Colors are mostly gray, white, and red.			white, gray, brown yellow, and red. The upper party white, gray, brown yellow, and red. The upper party of the formation commonly includes interbedded clay, of the formation commonly includes interbedded clay. The to medium sand, still, and some clay. part is largely coarse sand, gravel, and some clay.	locally present in some gravel. Colors are	Stratified sand and graves and second and metamorphic is predominantly quartoes; ignoous and metamorphic is predominantly quartoes; ignoous are pale to yellowish rock fragments are scarce. Colors are pale to yellowish prown. Caps hills in western part of Huntington and brown. Caps hills in western part of Huntington and brown.	Band, gravel, clay, and sift. Lignils present at party or clay layers. Cohorn are brown and gray. These deposits are present in deep buried valleys and may inposits are present in deep buried valleys and the Jameon clude equivalents of the Chardmars clay and the Jameon clude equivalents of the Chardmars clay and the Jameon clude equivalent to the control of the control of the clay lenses; unit	ground moraine il area pride ground moraine of the moraine and possibly as buried ground moraine and possibly as buried ground moraine and possibly as buried ground and Outwash deposits of brown well-extratified sand and contrast predominantly quarters but containing bioritie gravel—predominantly quarters but containing bioritie and other dark minerals and ignocus and measured; channel and valley-fill, and outwash-plain deposits, channel and valley-fill, and outwash-plain deposits, channel and valley-fill, and outwash-plain deposits and gravel for contact deposits of orderly stratified sand and gravel fashed masses of till in the Bonkonkoms and and isolated masses of till in the Bonkonkoms and Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of brown and gray silt and clay Gladolacustrine deposits of contact and gray silt and clay Gladolacustrine deposits of contact and gray silt and clay Gladolacustrine deposits of contact and gray silt and clay Gladolacustrine deposits of contact and gray silt and clay gray	Till composed of unasserted clay, sand, and boulders as	Sand, gravel, silt, and elay; organic mud, peet, loam, and shells. Colors are brown, yellow and gray.	Character of deposits
Water reservoir.	nd in Hunding	Relatively impermeable. Acts as a confining bod, which retards but does not prevent movement of water between the Magothy(?) formation and the Lloyd sand member.	most important source of water to wells. Unconfined conditions are common in uppermost part of formation, but confined conditions prevail in the lower part; some wells flow.		the upper part. Several public-supply were account the basal sone have yields ranging from 1,000 to 1,500 gpm the basal sone have yields from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 to 90 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from 30 gpm per ft of draw-and specific capacities from		erally its sover the state of the obtained from these desupplies for domestic use are obtained from these posits, such as at wells 84, 826 and 827. No large posits, such as at wells 84, 826 and 827. No large positic supply or industrial wells were screened in these public supply or industrial wells were screened in these public supply or industrial wells were screened in these	presumably yield moderate to large supplies of these constructed wells. One well, \$16,137, screened in these constructed wells. One well, \$16,137, screened in these constructed wells. One well and has a specific capacity of deposits yields 1,400 gpm, and has a specific capacity of deposits and clay beds confine water in adjacent water-bearing beds. The position of the property o	o preunitation. Outwash and ice-contact deposits are moderately to highly of the contact deposits are moderately to highly of the contact deposits generally at deposits of the contact deposits generally at deposits of the contact as in 700 to early at deposits capacities of public-supply wells range in from 22 to 22 gpm par to drawdown. Water is generally fresh and uncomfined. Chief source of water for early fresh and uncomfined. Chief source of water for domestic, public-supply, industrial, and irrigation wells all domestic, public-supply, industrial, and irrigation wells and operates have allocated and contact of water between permeable and locally retard movement of water between permeable and locally retard movement of water between pour adjacent water-bearing beds in Pleistocene and Cretacous deposits.	Till, relatively impermeable; oranmonly causes perched- water bodies to form locally and impedes recharge from	Sandy and gravelly beach deposits may rownly year summer applies of fresh to brackish water to wells. Marine sit and clay in north-shore harbors retard salt-water encroschment and confine underlying squiters.	Water-bearing properties

DIG CONTRIBUTIONS TO THE HYDROLOGY OF THE UNITED STATES

The lower part of the Magothy (?) formation becomes increasingly coarser textured at depth, as indicated by the greater frequency of gravelly layers. Several wells, which have penetrated the basal zone of the Magothy (?), have penetrated thick layers of gravel intercalated with layers of finer grained sediments (pl. 4). This gravelly zone, which appears to be present through most of the project area, rests directly on the clay member of the Raritan. It crops out in bluffs along the northwest coast of Lloyd Neck (pl. 2). The upper limit of the gravelly zone is poorly defined but is presumably gradational into finer grained sediments characteristic of the upper part of the Magothy (?). The maximum thickness of this zone is about 200 feet.

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Most of the wells in the project area that penetrate Cretaceous deposits are screened in the upper part of the Magothy (?) formation, where the preponderance of fine-grained materials limits the water-yielding capacity of the wells. Locally, there are more productive water-bearing zones, but these are generally of small vertical and lateral extent. The basal part of the Magothy (?) is the most productive water-yielding zone of the formation. Although relatively few wells were screened in this zone in 1960, test-well data indicate conditions favorable for development to meet future water demands. The Magothy (?) formation is the second most important source of water tapped by industrial and public-supply wells in the project area—particularly in or near the following localities: Centerport, Cold Spring Harbor, East Northport, Greenlawn, Indian Head, Kings Park, Melville, Smithtown, and South Commack. In or near these localities individual wells screened in the Magothy (?), at depths ranging from 246 to 593 feet, yield from 600 to 1,700 gpm. The specific capacity of individual wells ranges from 16 to 86 gpm per foot of drawdown and generally is somewhat lower than that of wells tapping water-bearing material in the Pleistocene deposits. The coefficients of transmissibility of the Magothy (?) water-bearing material were computed from the specific capacity (Theis and others, 1954) of typical public-supply wells. On the basis of these values of transmissibility and an estimated thickness of aquifer, the computed coefficients of permeability 2 ranged from 450 to 750 gpd per sq ft (table 3). In 1957, approximately 44 percent of the total withdrawal for public supply and industrial use in the Huntington-Smithtown area was pumped from the Magothy (?) formation.

HYDROGEOLOGY OF HUNTINGTON-SMITHTOWN A. N.Y. D19



TABLE 3.—Estimated permeability of water-bearing material in the Magothy (1) formation and Pleistocene deposits

Well	Screen zone (ft below land surface)	Specific capacity (gpm per ft)	Permeability (gpd per sq ft)
	Magothy(?) formation		
\$12079 \$13876 \$14521 \$15514 \$15515 \$16129	459-496, 527-552	50 38 86 71 16 78	550 450 750 650 450
	Pleistocene deposits		
S874	85-126 438-501	91 31 79 62 221 90 46	900 1, 500 900 1, 200 1, 000 750

PLIOCENE(?) SERIES MANNETTO GRAVEL

The type area of the Mannetto gravel is the Mannetto Hills of eastern Nassau County. Crosby s correlated these deposits with the Lafayette gravel of late Pliocene age. Fuller (1914, p. 85) considered the deposits to be remnants of a glacial outwash sheet of early Pleistocene age. The author has found no new evidence to support either interpretation of the age of this unit. The Geological Survey considers the Mannetto to be of Pliocene(?) age (Suter and others, 1949, footnote p. 9).

The Mannetto gravel has been identified by the author only in Huntington in exposures in the southern part of the West Hills where it rests on the buried Cretaceous surface. Other small outcrops were mapped by Fuller (1914, pl. 1) in the Dix Hills and several other places in the project area. These are not shown on plate 2 as the author was unable to confirm their presence. The Mannetto has also been correlated in a few well records (pl. 4).

In surficial exposures in the West Hills, the Mannetto gravel is largely composed of current-bedded quartz sand and gravel and, in places, layers of clay. The sand grains and the pebbles are commonly pitted. Rarely, weathered igneous and metamorphic rock and ferruginous sandstone fragments are present in the deposits.

¹ The coefficient of transmissibility is the rate of flow of water, in gallons per day, at the prevailing temperature, through each vertical strip of aquifer 1 ft wide having a height equal to the thickness of the aquifer, and under a unit hydraulic gradient.

The coefficient of permeability is the rate of flow of water, in gallons per day, through a cross section of 1 sq ft under a unit hydraulic gradient at a temperature of 60°F.

² Crosby, W. O., 1910, Report on the geological relations of the ground water of Long Island: Board of Water Supply, City of New York, unpub. rept., p. 52.

The color of the Mannetto gravel ranges from light brown to orange brown. The preponderance of quartz and the scarcity of dark minerals and rock particles is characteristic of the Mannetto, as contrasted with the heterogenous composition of the upper

Pleistocene deposits.

In most places the base of the Mannetto gravel rests on Cretaceous deposits at altitudes well above sea level (pl. 4). The Mannetto generally lies above the water table and consequently is of little importance as a source of water. Locally, however, some of the formation may lie in the zone of saturation and, in such places, may be a source of water. For example, well S4 (U.S. Geol. Survey, 1938, p. 12) reportedly penetrated 347 feet of sand and gravel that is probably partly of Mannetto age. The static water level in the well is reported to be 298 feet below the land surface. This unusually thick section of sand and gravel appears to lie in a narrow and steep-sided tributary of the Huntington buried valley. The floor of this tributary is near or slightly above sea level. Well S927 (Roberts and Brashears, 1945, p. 40), located north-northeast of well S4, penetrated 300 feet of coarse sand and gravel of probable Mannetto age before reaching the Cretaceous. Elsewhere, the Mannetto gravel has not been identified in deep wells, although it may be present in some buried valleys. Presumably, most of the Mannetto was dissected and removed by erosion prior to the deposition of the upper Pleistocene sequence.

PLEISTOCENE SERIES

Deposits of Pleistocene age mantle Cretaceous formations almost everywhere, but in a few places they rest on Pliocene (?) deposits. The thickness of the Pleistocene deposits ranges from 0 to more than 650 feet and averages 200 feet. Within the project area, these deposits may include three Pleistocene depositional sequences. The Jameco gravel and Gardiners clay, which are of post-Mannetto age, underlie deposits of the Wisconsin glacial stage in some deep buried valleys of northwestern Nassau County (Swarzenski, 1961, p. 33-34, and p. 42). Similar sequences have not been identified in the Huntington-Smithtown area, although some of the silt and clay bodies and the associated sand and gravel deposits in buried valleys may be equivalent to the Gardiners clay and the Jameco gravel. In this report these two formations are included with undifferentiated deposits largely of Pleistocene age that may also include deposits of Tertiary (?) age in some places. The bulk of the Pleistocene deposits belong to the latest sequence laid down during the Wisconsin glacial stage and are referred to in this report as upper Pleistore deposits.

The thickness and distribution of Pleistocene deposits were chiefly controlled by an older, now buried topography formed on the Cretaceous surface. This topography was the product of stream erosion, which probably began during the Tertiary and was later modified by overriding ice sheets and melt-water streams during the Pleistocene epoch. Information from well logs in the Huntington-Smithtown area indicates that a series of deep valleys were cut in the buried Cretaceous surface (pl. 3). Although the main buried valleys generally slope northward, major tributaries flow along eastwest lines-presumably along softer, less resistant beds in the Cretaceous.

Because of the lack of well data, the shape, depth, and extent of most of the buried valleys can be defined only approximately. In western Huntington the presence of a particularly deep valley (Huntington buried valley) was established from correlation of well logs and cores taken at wells S16137T, S14675T, S15190, and S16049T (pl. 4). At well S16137T, 604 feet of deposits of Pleistocene and possibly Tertiary age were penetrated without reaching the Cretaceous. This test well penetrated the greatest thickness of Pleistocene deposits known in the project area. At well S14675T the basal gravel zone of the Magothy (?) formation was penetrated at 314 feet below sea level beneath 534 feet of post-Cretaceous deposits—probably all of Pleistocene age. The axis of this valley probably sloped northward, and in the northern reach of the valley the Magothy (?) formation and the clay member, and possibly even the Lloyd sand member, of the Raritan formation may have been completely removed by erosion. In the Northport area, evidence of another deep valley (Northport buried valley) was disclosed by core samples from well S11105, where 545 feet of Pleistocene deposits was penetrated to a depth of 370 feet below sea level. In Smithtown the axis of a deep buried valley is poorly defined, owing to lack of deep-well data. However, several wells (pl. 4) in this valley have penetrated Pleistocene deposits to depths as great as 300 feet below the land surface, of 185 feet below sea level.

The Pleistocene deposits are predominantly composed of stratified sand and gravel, although thick layers of nonmarine silt and clay occur in the buried valleys, and a thin surficial mantle of unstratified glacial till is common on the uplands north of the Harbor Hill terminal moraine. The sand and gravel are largely composed of quartz, but igneous and metamorphic rock fragments and biotite, hornblende, and augite are also generally present. The colors of the deposits are generally brown, yellow, or gray. An extensive Pleistocene clay unit has been identified in several wells in the major buried valley, which extends beneath most of Smithtown (pl. 4, and

fig. 3). Locally, thick but discontinuous clay bodies of Pleistocene age also have been penetrated in wells in other parts of the project area. In general, they lie in the larger buried valleys, the floors of which are commonly below sea level. The clay unit of Smithtown and the other discontinuous clay bodies may include equivalents of the Gardiners clay, as well as glaciolacustrine deposits laid down during the Wisconsin glacial stage. All these clay deposits are intercalated with coarse sand and gravel.

The saturated sand and gravel beds in the Pleistocene deposits yield moderate to large supplies of water to properly constructed

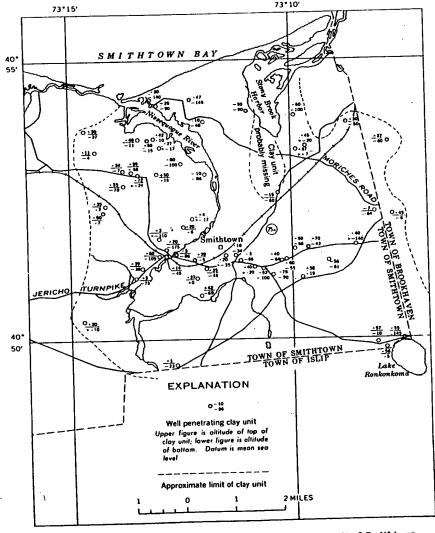


Figure 3 .-- Map showing approximate areal extent of the clay unit of Smithtown.

wells, but the clay bodies act as local confining beds for waterbearing zones in Pleistocene sand and gravel and also in places for water in the Cretaceous deposits. The Pleistocene deposits constitute the most important source of water in the project area for numerous small domestic wells and also for industrial and publicsupply wells in and near the villages of Centerport, Dix Hills, Greenlawn Manor, Hauppauge, Huntington Station, Northport, and South Huntington. In these localities, individual public-supply wells screened in water-bearing sand and gravel beds of Pleistocene age at depths ranging from 100 to 602 feet yield from 1,000 to 1,700 gpm. Specific capacities of these wells range from 31 to 221 gpm per foot of drawdown and on the average are higher than those of wells tapping the Cretaceous deposits. Transmissibilities of Pleistocene water-bearing materials tapped by typical public-supply wells were computed from specific capacities (Theis and others, 1954). By the use of these values and the estimated thickness of the aquifer, permeabilities ranging from 750 to 1,500 gpd per sq ft (table 3) were computed. In 1957, ground-water withdrawals from wells screened in water-bearing sand and gravel of Pleistocene age accounted for 53 percent of the total pumpage for public supply and industrial use in the Huntington-Smithtown area.

UNDIFFERENTIATED DEPOSITS OF PLEISTOCENE AND PLIOCENE(?) AGE

In some of the deeper buried valleys of the project area, wells have penetrated sections of sand and gravel associated with bodies of silt and clay that may include equivalents of the Gardiners clay and the Jameco gravel of Pleistocene age and possibly the Mannetto gravel of Pliocene (?) age. As these deposits cannot be identified or defined areally on the basis of available faunal and lithologic evidence, they are grouped in undifferentiated deposits of Pleistocene age.

At well S16137T (see following log) in the South Huntington well field, an unusually thick section of these undifferentiated deposits was penetrated between depths of 202 and 604 feet (47 to 449 ft below sea level). The fine lignitic sand, silty clay, and clay between 202 and 407 feet may be an equivalent of the Gardiners clay. The remainder of the sand, gravel, silt, and clay sequence between 407 and 604 feet may include the Jameco gravel and possibly the Mannetto gravel.

At present (1960), well S16137 (pl. 4) is the only well known to tap the undifferentiated deposits. This well, screened from 540 to 602 feet in fine to coarse sand containing some gravel and clay, yields 1,400 gpm and has a specific capacity of 46 gpm per foot of drawdown. Thickness (feet) Depth (feet)

S16137-T. (8E)

[South Huntington Water District, 5th Ave., South Huntington, N.Y. Drilled 1957 by C. W. Lauman and Co., Inc. Test well. Casing diameter 4 in, screen set from 186 to 185 ft. Alt 155 ft. Driller's log]

cent deposits: Sandy loam, gravel, and clay layers	6	6
Sandy loam, gravel, and clay layers		46
mer Picistocene deposito.	40	46
Sand coarse, and give graves, and	94	140
Sand, coarse, and graver, bit likele gravel brown	6	146
Sand, medium to coarse, and a serie brown	10	156
Sand coarse, grit, and graver, some	9	165
Sand coarse, grit and graver, or and the same	6	171
Sand, fine to coarse, and some start brown	10	181
Sand, fine to coarse, and Brie, see	4	185
Sand coarse, and gire, some one,	7	192
Sand, fine to medium, and some of sendy clay, brown	5	197
Sand, fine; some clay and layers of sainty clay, Stand, Sand, medium to coarse, and some clay; brown	5	202
Sand, medium to coarse, and some		000
eistocene deposits unumerentation.	4	200
Sand fine, Drowit	9	21
Sand, nne, gray, iighivo	6	22
Clay, sandy, gray	20	24
Clay, gray; layers or oney Berry	11	25
(low gilly: lavele of oral) b3	9	26
Clay silty; layers of clay; gray Clay; layers of silty clay; gray Clay, gray Clay, sandy; layers of fine sand and gravel; brown Clay, sandy, brown Clay, sandy, layers of fine sand and clay; brown	15	27
Clay, gray	11	28
Clay, sandy; layers of line sand and graver,	4	29
Clay, sandy, brown	5	29
URV. BRIUV. Injuit of the second	6	30
Sand. coarse, and gitt, isy it laws of coarse sand; brown	5	30
Clav. sandy, grit, and graver, and	4	31
Sand, nne, and sandy blown	11	32
Clay, sandy, and gire, layers because	4	32
Sand, fine, grit; and sandy only;	5	33
Clay and sandy day, layout and alove brown	6	33
Sand, fine, and grit; some clay and grit; brown	5	3
Clay, sandy; layers of the sand direction	5	3
Sand, fine, and sandy cray, brown	4	3
Sand, coarse, grit, and graver, sent brown	ו ס	3
Sand, fine, and grit; layers of sandy clay; brown	6	3
Sand, medium, grit, and sandy clay:	1	١ .
Sand, medium, and grit; some ciay and fumps of same brown	4	3
brown	1 11	3
Sand, fine, brown Sand, fine, and solid and sandy clay; brown Sand, fine, and solid and sandy clay; brown	5	3
Sand, fine, and solid and said, ordered and grit hrown.	ו ש	3
Clay sandy; layers of incuration of the bearing	. 4	3
Sand, fine, layers of sandy clay and gravel; brown-Sand, fine, brown-Clay, sandy, solid, and grit and fine to coarse sand; brown-Clay, sandy, solid, and grit and fine to coarse sand; brown-Clay, sandy, solid, and grit and fine to coarse sand; brown-Clay, sandy, solid, and grit and fine to coarse sand; brown-Clay, sandy, solid, and grit and fine to coarse sand; brown-Clay, sandy, sandy	. 6	1 4
Dand, lille, Diowil	. 1	1 3
Clay, sandy, solid, and grit and tine to coarse sand, Sand, coarse, brown	. 5	
Sand, coarse, brown-	-1 "	
Sand. The to coalse, blowns	_ 42	1 4
Sand, coarso, brown	י ו	1 '
Clay, solid and sandy, myers of the clay	_ 0	'
Sand, line, clayey, gray, and	_ #0	1 .
Clav. sandy, klay	_ 0	1
Clay, sandy, gray	_ 4	- 1
Sand, hne, clayey, blowings, and brown	-1 11	
Sand, fine, brown	_ 5	
Clay, solid and sandy, and fine sand; brown Clay, sandy, layers of fine sand; brown Clay, sandy, brown Sand, fine, brown Sand, fine, brown Sand, sand grit; brown	- 4	
Clay, sandy, brown	_1 0	

Thick- ness (feet) (feet)

S16187-T. (8E)

[South Huntington Water District. 5th Ava., South Huntington, N.Y. Drilled 1957 by C. W. Lauman and Co., Inc. Test well. Casing diameter 4 in, screen set from 180 to 185 ft. Alt 155 ft. Driller's log)

	l l	
Pleistocene deposits undifferentiated—Continued	1	
Sand, very fine, and sandy clay; streaks of clay; brown	6	511
Sand, coarse, grit, and gravel; brown	10	521
Sand very fine to fine, brown	5	526
Sand, medium to coarse, brown	5	531
Clay and sandy clay; streaks of fine brown sand	5 5	536
Sand, coarse, grit, and gravel	11	547
	4	551
Sand, fine, brown	**	
Sand, fine to coarse, grit, and gravel; brown	5 6	556
Sand, medium to coarse, brown	ō	562
Sand, fine, brown	5	567
Sand, medium to coarse; some grit; brown	9	576
Sand, fine to coarse, brown	5 9 11	587
Sand, fine; layers of clay; brown	4	591
Sand fine, brown	13	604
		ı

UPPER PLEISTOCENE DEPOSITS

The upper Pleistocene deposits generally rest directly on the eroded surface of the Cretaceous deposits and form the bulk of the Pleistocene sequence in the Huntington-Smithtown area. In the northern part of the West Hills they lie on the Mannetto gravel of Pliocene (?) age, and in other places they lie on undifferentiated deposits of Pleistocene age. The upper Pleistocene deposits are thickest beneath the terminal moraines and in buried valleys, where in places they are more than 300 feet thick. The deposits include: (1) at least one and possibly two sheets of glacial till laid down directly as ground moraine by continental ice; (2) ice-contact deposits in the Ronkonkoma and Harbor Hill terminal moraines; (3) a considerable thickness of glaciofluvial deposits laid down by melt water streams in outwash plains and spillways during the advance, stagnation, and recession of the ice; and (4) discontinuous bodies of silt and clay laid down in glacial lakes and not exposed in the project area. The upper Pleistocene deposits are commonly brown, yellow, and gray.

A sheet of glacial till, generally less than 10 feet thick, forms a surficial mantle on most of the uplands of the project area north of the Harbor Hill end moraine. This till probably represents the ground moraine of the Harbor Hill ice. A second and older till sheet, largely buried but locally exposed in sand and gravel quarries in northwestern Nassau County, has been interpreted by Swarzenski (written communication, 1960) as the ground moraine of the Ronkonkoma ice. This till sheet also may be present in the Huntington-Smithtown area but has not been identified in prop or in well sections.

RECENT SERIES

Deposits of Recent age are not extensive in the Huntington-Smithtown area, and their thickness is rarely more than 20 feet. These deposits include beach sand and gravel, organic silt and clay in small ponds and marshes, and marine silt and clay in the north-shore bays and harbors. A soil zone of variable texture and generally less than 5 feet thick blankets the Pleistocene and Cretaceous deposits. The soil is characteristically loamy in most of the area, although in the central part of Smithtown it is somewhat sandy.

The water-yielding potential of the Recent deposits is small, owing to small areal distribution and thickness. The sand and gravel in the beaches and tombolos generally yield only brackish water, but in places the water is relatively fresh and is tapped by shallow driven wells for domestic supply. The marine silt and clay deposits in the north-shore bays and harbors act as aquicludes, which retard the landward encroachment of salt water and confine underlying fresh water in the coastal zones.

GROUND WATER

All the fresh water that occupies the intergranular voids of the Cretaceous, Pliocene (?), and Pleistocene unconsolidated deposits constituting the ground-water reservoir above bedrock is ultimately derived from precipitation. Of the total precipitation, part runs off on the land surface, part returns to the atmosphere by evapotranspiration, and part seeps down to the water table and replenishes the ground-water reservoir. Some of the water that reaches the water table circulates in the shallow part of the ground-water reservoir, but the rest moves down into the intermediate and deep parts of the reservoir, which, in places, is as much as several hundred feet below sea level. Water is discharged naturally from the reservoir by evapotranspiration in areas where the water table is close to the land surface, by effluent seepage into streams, and by upward leakage into salt water near the shoreline and offshore.

WATER-BEARING UNITS

Three discrete aquifers or water-bearing units have been recognized in the ground-water reservoir of the Huntington-Smithtown area. Each of these comprises parts of two or more of the stratigraphic units previously described and summarized in table 2. In addition, local bodies of ground water perched above the main water table have been observed at several places in the project area. The aquifers are defined chiefly by the hydraulic continuity deduced from the behavior of water levels in wells and by the degree of confinement of the water in the aquifer indicated by the

The Ronkonkoma and Harbor Hill terminal moraines are largely composed of crudely stratified sand and gravel deposits showing slump and collapse features and containing isolated masses of till. Isolated or coalescing kames and interspersed kettles account for the irregular surface of these moraines.

The bulk of the upper Pleistocene deposits is composed of stratified coarse sand and gravel laid down by melt water streams. Thick discontinuous bodies of silt and clay, however, are common in the buried valleys (pl. 4). These bodies are probably glaciolacustrine deposits, which may have formed during the recession of the Ronkonkoma ice and prior to the advance of the Harbor Hill ice.

The "clay unit of Smithtown," which underlies much of Smithtown (fig. 3), was considered by H. R. Blank (written communication, 1928) to be a possible equivalent of the Gardiners clay. The author believes, however, that the unit is probably a glaciolacustrine deposit in the upper Pleistocene sequence and may have been laid down in a glacial lake or lakes during the wasting of the Ronkonkoma ice. This unit is in a large buried valley, which lies in the eastern part of Smithtown. Its areal extent is only approximately defined by well data. Local continuity, however, is indicated by several wells in the Smithtown and Kings Park area (pl. 4 and fig. 3). In the adjacent areas it was either not deposited or it was removed by later stream erosion. Its upper surface generally lies above sea level and reaches a maximum altitude of 70 feet. The thickness is variable and ranges from a few tens of feet to 200 feet. The unit is predominantly clay, but some lenses of sand containing gravel and silt are found locally. The clay unit is generally brown or gray, which is characteristic of the upper Pleistocene deposits.

In many places a water-bearing sand and gravel zone (pl. 4) underlies this clay unit and is tapped by wells. The coarser materials are generally below sea level, and probably extend down to the underlying Cretaceous surface. At well S11810 in Smithtown, the sand and gravel zone rests on the Magothy(?) formation and is about 70 feet thick. Presumably, the sand and gravel were deposited by melt water streams during the advance of the Ronkonkoma ice.

An upper zone of gravelly stratified deposits commonly rests on the higher parts of the Cretaceous surface and on the Pleistocene clay bodies. This zone generally consists of yellow and brown layers of medium sand to coarse gravel containing a few boulder-size rock fragments. Rock fragments of igneous and metamorphic origin also are typically present. Much of this zone is not water bearing, as it lies above the zone of saturation.

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presence or absence of extensive confining beds or aquicludes. In this report the aquifers are designated as shallow, intermediate, and deep. The shallow and intermediate aquifers are separated only imperfectly by discontinuous silt and clay bodies. The intermediate and deep aquifers are separated much more effectively by a silt and clay aquiclude, which is relatively thick and areally extensive. Consequently, water is interchanged much more readily between the shallow and intermediate aquifers than between the intermediate and deep aquifers. The characteristics and limits of the perched ground-water bodies, the three aquifers and their related water-table and piezometric surfaces, and the nature of water-level fluctuations in wells tapping these aquifers are described and discussed in following sections.

PERCHED GROUND-WATER BODIES

Discontinuous bodies of perched water are fairly common in the Huntington-Smithtown area. These generally lie on relatively thick layers of impermeable glacial till or on clay of Pleistocene age or on the Magothy (?) formation above the regional or main water table. The most extensive perched ground-water body occurs in the Harbor Hill end moraine in the northern part of the West Hills. Other perched bodies have been noted during the drilling of wells S16276 at Northport, S16880 at San Remo, and S16873 at Deer Park (pl. 1). Several wells that have tapped perched water bodies at altitudes as much as 200 feet above the main water table also are described by Veatch and others (1906, pl. 12). Wells S229 and S16876, both in West Neck, probably penetrate perched water bodies.

Domestic wells are generally not finished in perched water bodies, because yields are small and relatively undependable.

SHALLOW AQUIFER

The shallow aquifer generally includes saturated coarse sand and gravel in the upper Pleistocene deposits and, in some areas, hydraulically connected finer grained sand and gravel beds in the upper part of the Magothy(?) formation. Locally, saturated Mannetto gravel may also form part of the shallow aquifer. The shallow aquifer extends beneath the land area of the project, and it terminates at or near Long Island Sound. Fresh-water lenses in the shallow aquifer also occur on Lloyd Neck, Eatons Neck, and Little Neck. The aquifer extends from about 90 feet above to about 80 feet below sea level. Through this range, water in the aquifer is generally unconfined.

The upper limit of the aquifer is the regional or main water table (pl. 5). The lower limit is marked by discontinuous clay bodies, ostly in the upper Pleistocene deposits but in places in the

othy (?) formation. In much of Smithtown a relatively extensive glaciolacustrine clay unit in the upper Pleistocene sequence forms the lower limit of the aquifer at levels ranging from about 70 feet above to 80 feet below sea level. In some parts of the project area, specifically where the buried Cretaceous surface (pl. 3) lies at altitudes above 100 feet, the Magothy(?) formation forms the entire shallow aquifer. Because of differences in permeability—lower in the Magothy(?) and higher in the Pleistocene—the hydraulic gradient within the aquifer may change markedly near the contacts of these two stratigraphic units.

Local ground-water bodies, which may be considered to represent detached segments of the shallow aquifer, are present on Lloyd Neck, Little Neck, and Eatons Neck. These bodies, shown by closed 5- and 10-foot contours (pl. 5), are sustained very largely by local recharge, and possibly also on Lloyd Neck and Little Neck by upward leakage from the intermediate and deep aquifers.

The configuration of the main water table in May 1959, shown in plate 5, is based on water-level measurements in 51 observation wells and on water-surface altitudes observed in effluent streams and ponds that intersect the water table. Two prominent mounds on the main water-table divide of Long Island are present in the project area. The western mound includes all the broad area above the 70-foot contour in south-central Huntington, but only a small part of the eastern mound, above the 70-foot contour, is included in the easternmost part of Smithtown (pl. 5). Between these two mounds is a pronounced low, or trough, in the water table, which coincides roughly with the valley of the Nissequogue River. Two ground-water mounds represented by the closed 80- and 90-foot contours are present on the eastern high. The eastern mound (80-ft closed contour mostly north of well S16873) is apparently related to material of low permeability in the Magothy(?) formation which constitutes the shallow aquifer in this area. On the other hand, the western mound (90-ft closed contour) appears to be related to material of low permeability in the Pleistocene deposits.

North of the western mound, the water table slopes generally north toward Long Island Sound at gradients of about 15 to 30 feet per mile. However, southward deflections and reentrants in the 10- and 20-foot contours and local steepening of gradients are indicated near Cold Spring, Huntington, Centerport, and Northport Harbors (pl. 5). Between the western and eastern mounds the water table slopes generally toward the Nissequogue River at 20 to 30 feet per mile. North of the eastern mound the water table also slopes north toward the

sound; a marked reentrant in the 10- and 20-foot contours is indicated near Stony Brook Harbor.

The water table is not static but fluctuates in response to changes in ground-water storage, particularly in the shallow aquifer. The most notable fluctuations are cyclical and are associated with the seasonal differences in the rates of recharge from precipitation and of discharge by evapotranspiration. Precipitation is generally evenly distributed throughout the year. During the colder months when evaporation and transpiration of plants are at a minimum, recharge from precipitation is at a maximum. Consequently, ground-water storage increases and the water table tends to rise. Conversely, during the warmer months when evaporation and transpiration are at a maximum, recharge is at a minimum. As a result ground-water storage is depleted by natural and artificial discharge and the water table declines. This phenomenon is illustrated in hydrographs of wells S1811, S1812 and S4827 (fig. 4) screened a short distance below the water table. The hydrographs show both long-term and seasonal cyclical trends and indicate that the water table normally declines during summer and autumn and rises during winter and spring. At well S1811 the water table is about 3 feet below land surface. The water-level fluctuations in this well are typical of a shallow water table at depths of less than 15 feet below land surface. The hydrographs for wells S1812 and S4827 indicate a water-table fluctuation of about 20 feet and 150 feet below land surface, respectively. The hydrograph (fig. 5) of well S8912, which is 28 feet deep, shows that there is a fairly close relation between water-table fluctuations and the monthly precipitation as recorded at the Lake Ronkonkoma rain gage. In this well the water table rises shortly after periods of high precipitation. Water-level fluctuations in deeper wells (S3514, fig. 5) in the shallow aquifer are not so directly related to short-term precipitation trends. At well S3514 the water table averages about 87 feet below land surface. Apparently, however, a relation exists with the long-term trends indicated by cumulative departure from average precipitation (fig. 5), at least from 1951 to 1958.

The water levels in shallow wells in the project area have been observed to fluctuate seasonably as much as 8 feet, but the average range is generally between 1 and 4 feet. These fluctuations result largely from the seasonal distribution of natural recharge from precipitation, from natural discharge by evapotranspiration, and by spring flow into streams and Long Island Sound. In 1960 there was little or no evidence of any long-term decline in the average position of the water table attributable to withdrawal from wells.

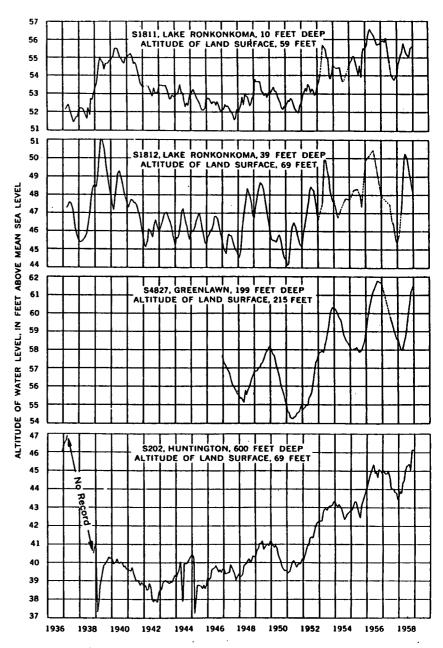


FIGURE 4.—Hydrographs of three wells in the shallow aquifer and one well in the deep

FIGURE 5 .- Comparative hydrographs of two wells screened in the shallow aquifer, and monthly precipitation at Brentwood and Lake Ronkonkoma.

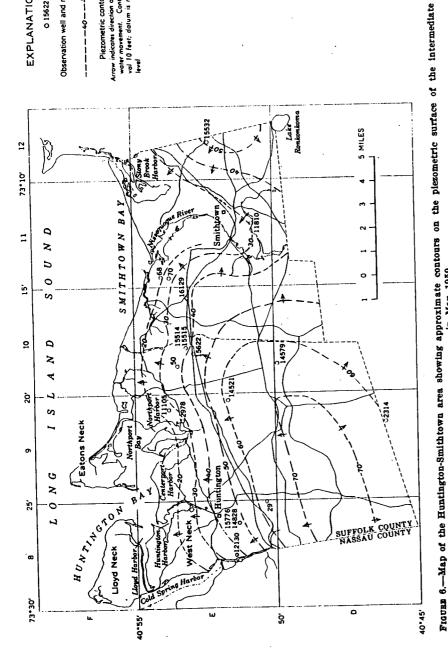
INTERMEDIATE AQUIFER

The intermediate aquifer includes most of the Pleistocene and possibly some Pliocene (?) deposits that lie in the deeper parts of the buried valleys and the bulk of the Magothy (?) formation down to the top of the clay member of the Raritan formation. The intermediate aquifer extends beneath virtually all the land area and possibly beneath much of Huntington Bay and the contiguous saltwater bodies. However, its hydraulic and chemical characteristics on Lloyd and Eatons Necks are poorly defined by present (1960) well data. Apparently, beneath Lloyd Neck it contains fresh water, but beneath most, if not all, of Eatons Neck the water in the aquifer is salty. The aquifer is nearly wedge shaped, and the thickness increases generally toward the south and southeast. Its minimum thickness, in the northwest part of the project area on Lloyd Neck, is less than 200 feet. Near the Half Hollow Hills (pl. 4), the aquifer is nearly 800 feet thick, and in the vicinity of Lake Ronkonkoma, it is about 600 feet thick. The top of the aquifer is irregular and is marked by discontinuous clay bodies both in the Pleistocene deposits and in the Magothy (?) formation. The altitude of the top ranges from about 60 to almost 200 feet below sea level. The lower limit of the aquifer, which coincides with the top of the clay member of the Raritan formation, ranges from 100 feet to more than 700 feet below sea level. Water in the aquifer is generally confined, but the confinement is more pronounced in its deeper parts.

The approximate configuration of the piezometric surface of the intermediate aquifer in May 1959 is shown in figure 6 by means of 10-foot contours referred to sea level. The surface as shown is approximate owing to lack of control data, particularly on Lloyd and Eatons Necks and elsewhere near the north shore and in the southern part of Huntington. This surface is a somewhat subdued replica of the water table (pl. 5). From a piezometric high represented by the 70-foot contour in south-central Huntington, the surface slopes south to the Atlantic Ocean and north to Long Island Sound at gradients of 5 to 15 feet per mile. A prominent depression on the surface is shown by the pronounced southward bending of the water level in the valley of the Nissequogue River.

As is characteristic in the ground-water reservoir of Long Island, the piezometric surface of the intermediate aquifer in the inland (southern) part of the project area is commonly 5 to 25 feet lower than the water table. This relation is reversed near the north shore where the piezometric surface is from 5 to 10 feet higher than the water table, as for example near Huntington, Centerport, and Northport Harbors. In the intervening belt, which lies approximately be-

EXPLANATION



tween the 40- and 50-foot piezometric contours (pl. 5), heads in both shallow and intermediate aquifers are virtually the same.

The "clay unit of Smithtown" acts as an effective aguiclude between the shallow and intermediate aquifers, which causes pronounced differences in head both locally and areally. Evidence of this condition is indicated by differences in head observed at wells S4377 and S15532 both located in Smithtown to the east of Saint James (pl. 1). Well S4377, which ends at 48 feet in the shallow aquifer above the clay unit, has a water level about 64 feet above sea level, and well S15532, which is screened from 181 to 196 feet in the intermediate aquifer below the clay unit, has a water level about 50 feet above sea level. Elsewhere in the project area, wells in the South Huntington Water District well field 1 also provide good examples of differences in head in wells in the shallow and intermediate aquifers (fig. 7) which are separated by a clay of Pleistocene age. The lateral extent of the clay beyond the well-field limit at South Huntington is not known. However, the clay may extend throughout much of the deep buried valley (Huntington valley, pls. 3 and 4). The water level in wells S28 and S29 (fig. 7), which are screened above and below the clay bed, respectively, have a head difference of 33 feet even though the vertical interval between the screens of the wells is only about 100 feet. Also, in well S16137T, screened near the bottom of the shallow aquifer, the head is 96 feet above sea level. In nearby well S16137, screened in the intermediate aquifer about 350 feet below the bottom of well S16137T, the head is about 50 feet above sea level, a difference of 46 feet.

Because water in the intermediate aquifer is confined, waterlevel fluctuations in wells screened in the aquifer generally indicate changes in artesian pressure. In wells screened in the shallow aquifer, the long-term or seasonal changes in pressure commonly follow with some lag the fluctuations of water levels. This relationship is shown in hydrographs (fig. 8) of wells screened in the shallow and intermediate aquifers. For example, comparison of the hydrographs of wells S28 and S29, which are at approximately the same site, suggests that the seasonal high water level in 1958 in the intermediate aquifer may lag several months behind corresponding changes in the shallow aquifer. The hydrographs of wells S3514, S14579 and S70 (fig. 8) also suggest a lag in fluctuations of several weeks to a few months. On the other hand, the fluctuations of water levels in wells S4268 and S15622 appear to be nearly synchronous, except for the period from December 1957 through February 1958. The reasons for the apparent similarity in part of the record are unknown.

S128727 S161377 S16137 **S27 S29** surface 200' Land Water table 100 aquifer Shallow SEA LEVEL 96 Confining Intermediate 100 ρ_{eq} aq_{uifer} 200' 300' 100 FEET Datum is mean sea level 400

EXPLANATION

Gravel Sand

Sand and clay Clay and silt

Well screen and altitude of water level at screen depth

FIGURE 7.—Hydrogeologic section through South Huntington Water District well field 1 showing head relationships in shallow and intermediate aquifers.

DEEP AQUIFER

The deep aquifer, which is almost everywhere coincident with the Lloyd sand member of the Raritan formation, lies beneath the entire project area. It also may extend beneath Huntington Bay and its contiguous inlets and harbors and beneath Lloyd and Eatons Necks. The deep aquifer beneath most of Lloyd Neck contains

fresh water, but beneath Eatons Neck the water in the aquifer is probably salty. Locally, where the clay member of the Raritan formation has been removed by post-Cretaceous erosion, sand and gravel beds of presumed Pleistocene age are in hydraulic continuity with the Lloyd and form part of the deep aquifer. This condition probably exists in the deepest part of the buried Huntington valley (pl. 3 and 4) in western Huntington. Except where it is absent, the clay member of the Raritan overlies the Lloyd and acts as a thick and laterally extensive aquiclude which retards movement of water into and out of the Lloyd. Where the clay member is absent, clay bodies in the lower part of the Pleistocene sequence act as acquicludes, which confine water in the deeper Pleistocene sand and gravel and in the hydraulically contiguous Lloyd. Of the three aquifers in the project area, the deep aquifer is hydraulically the most perfectly confined.

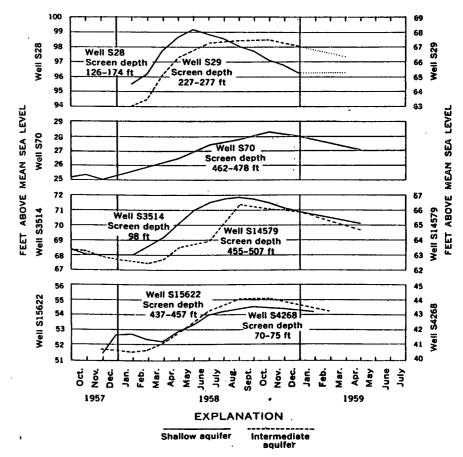


Figure 8.—Comparative hydrographs of wells screened in the shaller and intermediate aquifers.

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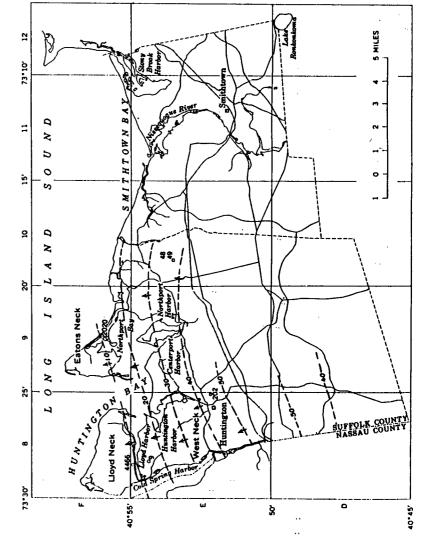
Because of scanty well data, it is not possible to construct an accurate map of the piezometric surface of the deep aquifer. Data are lacking at present (1960) for Smithtown and the southeastern part of Huntington. Furthermore, the piezometric surface shown in figure 9 for the northern and western part of Huntington is only approximate as points of control are scattered. As shown, the piezometric surface of the deep aquifer is at maximum altitudes of somewhat more than 50 feet in west-central Huntington. From the piezometric divide, which is between the 50-foot contours, the surface slopes north and south to sea level at gradients of about 5 to 15 feet per mile. Comparison of the shapes of the piezometric surfaces of the intermediate and deep aquifers (figs. 6 and 9) suggest that the piezometric divide of the deep aquifer lies about 2 to 21/2 miles north of the piezometric divide of the intermediate aquifer. This condition apparently is a function of the asymmetry in crosssectional profile of Long Island's ground-water reservoir, whose thickness on the south shore is three or more times greater than it is on the north shore. In the project area the highest observed head in the deep aquifer was about 46 feet above sea level at well S202 in Huntington, and the lowest was 10 feet above sea level at well S4466 on Lloyd Neck.

In the southern part of Huntington the piezometric surface of the deep aquifer is 20 to 30 feet lower than that (fig. 6) of the intermediate aquifer, but in the vicinity of the northern 50-foot contour (fig. 9) the heads in the two aquifers are virtually the same. North of this contour the heads of the deep aquifer become progressively higher than those of the intermediate aquifer. Thus, in the vicinity of Huntington, Centerport, and Northport Harbors, piezometric heads of the deep aquifer are 5 to 10 feet higher than those of the intermediate aquifer.

Fluctuations of artesian pressure in the deep aquifer generally reflect seasonal trends similar to those of the water table, particularly where the water table is more than 100 feet below land surface. This relationship is shown by the hydrographs (fig. 4) for well S4827 screened in the shallow aquifer and well S202 in the deep aquifer. The minor irregularities in the overall water-level trend of the hydrograph of well \$202 are probably caused by interference effects from pumping at public-supply wells S8 and S1313, which are also screened in the deep aquifer and are located about 1 mile north of well S202.

Short-term fluctuations in head also occur in wells screened in the intermediate and deep aquifers as a result of changes in load on confining strata. Fluctuations of this nature result from changes in atmospheric pressure, earth tides, earthquakes, and passing railroad trains. Such fluctuations are small, generally less than 0.1





foot, and are commonly masked by fluctuations of larger amplitude. Cyclical fluctuations in pressure also result from ocean tides, particularly in wells screened in the intermediate and deep aquifers near Long Island Sound. For example, at well S2020 located on a promontory between Duck Island Harbor and Northport Bay and screened in the deep aquifer, water-level fluctuations caused by tidal loading have a daily amplitude of as much as 3 feet between high and low tide. Tidal changes in Lloyd and Cold Spring Harbors also influence the water levels of wells S9 and S4466, both of which are screened in the deep aquifer.

RECHARGE

All the fresh water in the ground-water reservoir of the project area, as well as the rest of Long Island, is derived from precipitation. However, only a part of the total precipitation that falls reaches the water table. The amount which percolates down to the water table and recharges the reservoir is the residual of the total precipitation not returned to the atmosphere by evapotranspiration or lost to the sea by overland runoff. Owing to the highly pervious nature of the soil and the substrata and to the gentle slopes of the land surface, infiltration is relatively high. Of an average annual precipitation on the project area of 49 inches, 21 inches, or about 43 percent, is estimated to reach the water table.

The catchment surface on which recharge presumably takes place includes most of the land area of the project, or about 146 square miles. This catchment includes Lloyd and Eatons Necks but does not include an additional 7 square miles of high water table and tidal marshes which fringe the northern shoreline. A considerable part of the catchment area, however, is made impervious by buildings and pavements, but much of the runoff from such covered areas is recovered in storm water disposal (recharge) basins or large-diameter diffusion wells. The natural recharge from precipitation on the project area, exclusive of the high water-table areas, the tidal marshes and of Lloyd and Eatons Necks, is estimated to average about 140 mgd (million gallons per day). In addition, the recharge on Lloyd Neck is estimated to average about 5 mgd and on Eatons Neck about 2 mgd. The total for the project area then would be about 147 mgd. The rate of natural recharge varies greatly from season to season and from year to year depending on such factors as evapotranspiration, air and soil temperatures, soil-moisture conditions, and the nature and seasonal distribution of precipitation. During dry years, recharge is substantially less than average, and conversely in wet years it is more.

Natural replenishment of the intermediate and deep aquifers takes place entirely by downward movement of water from the shallow aquifer through discontinuities in clayey and silty beds and probably directly by slow movement through these aquicludes. Recharge of the intermediate aquifer probably occurs chiefly in the areas where the water table lies above an altitude of about 60 feet (pl. 5). The deep aquifer, in turn, receives recharge by downward leakage from the intermediate aquifer through an extensive aquiclude formed chiefly by the clay member of the Raritan formation. This recharge, which probably proceeds at a very slow rate, occurs chiefly where the piezometric surface of the intermediate aquifer lies above an altitude of about 60 feet (fig. 6).

Artificial recharge of the ground-water reservoir is effected by means of cesspools and septic tanks, which ultimately receive most of the water pumped from public-supply and domestic wells. For example, during 1957 an estimated average of about 9.8 mgd was returned to the ground by this means in the project area, and at the same time about 2.5 mgd was discharged directly into Long Island Sound through sewage disposal systems at the villages of Huntington and Northport and at Kings Park State Hospital. Also, as required by law, an average of about 0.7 mgd of water pumped from privately owned wells for industrial and cooling purposes during 1957 was returned to the ground through sumps and diffusion wells.

MOVEMENT

In the ground-water reservoir, water moves vertically and laterally from points of high head to points of low head along flow lines whose direction is normal to the contour lines shown for the water table (pl. 5) and the piezometric surfaces (figs. 6 and 9). Water in the shallow aquifer flows away from the two major highs on the main watertable divide of Long Island, represented by areas above the 70-foot watertable contour in south-central Huntington and eastern Smithtown (pl. 5). The general directions of ground-water flow are north toward the Long Island Sound, south toward the Atlantic Ocean, and also a pronounced lateral movement toward the trough in the valley of the Nissequogue River. Local directions of flow, which may deviate substantially from these general directions, are indicated by arrows on the water-table contours (pl. 5). Also, the peninsulas of Lloyd, Eatons, and Little Necks each contain a groundwater mound in the shallow aquifer and from the crests of these mounds the shallow ground water moves laterally outward to bounding salt-water bodies. Within the area circumscribed by the 60-foot water-table contour (pl. 5), a downward head differential generally exists between the shallow and intermediate aquifers. Consesuement

quently, downward movement of water from the shallow aquifer to the intermediate aquifer takes place.

The piezometric surface of the intermediate aquifer (fig. 6) indicates horizontal components of ground-water movement, which are generally similar to those in the shallow aquifer but apparently not so irregular. North of the 30-foot piezometric contour (fig. 6) there is commonly an upward head differential between the two aquifers which causes movement of water from the intermediate aquifer to the shallow aquifer, particularly in the coastal zones of Long Island Sound and of contiguous bays, harbors, and inlets, and probably also in the lower part of the Nissequogue River valley.

The directions of the lateral component of flow in the deep aquifer and in the intermediate and shallow aquifers are apparently similar. Pressure heads in the deep aquifer, however, are known only at a few scattered points in Huntington. Consequently, the piezometric surface (fig. 9) can be defined only approximately in western and northern Huntington. A downward head differential between the intermediate and deep aquifers exists within the 60-foot intermediate piezometric contour (fig. 6). Consequently, movement of water from the intermediate to the deep aquifer is possible within most of this area. However, north of the northern 50-foot piezometric contour of the deep aquifer (fig. 9) in the vicinity of Huntington, Centerport, and Northport Harbors and beyond, an upward head differential between the intermediate and deep aquifers causes movement of water from the deep to the intermediate aquifer. Because of the northerly position of the piezometric divide in the deep aquifer with respect to correlative divides in the intermediate and shallow aquifers, a large percentage of the water received by the deep aquifer apparently moves southward to the Atlantic Ocean, and the lateral movement of ground-water flow in the intermediate and deep aquifers is actually in opposite directions through a belt about 1 to 1½ miles wide. This condition is suggested by a comparison of figure 6 with figure 9, which indicates a northerly flow of ground water in the intermediate aguifer and a southerly flow in the deep aguifer.

The direction of ground-water flow and head relations in the ground-water reservoir are illustrated in the hydraulic profile in figure 10, which was prepared on the basis of water-level measurements and geologic data in several wells located along section X-X', (pl. 5). The equipotential lines are indicated for only the shallow and intermediate aquifers, as hydraulic data for the deep aquifer were not available in the line of profile. The flow direction, indicated by arrows, is generally parallel to the plane of the section. The effects of several thick aquicludes in the northern part of section X-X' on the direction of ground-water flow are indicated in

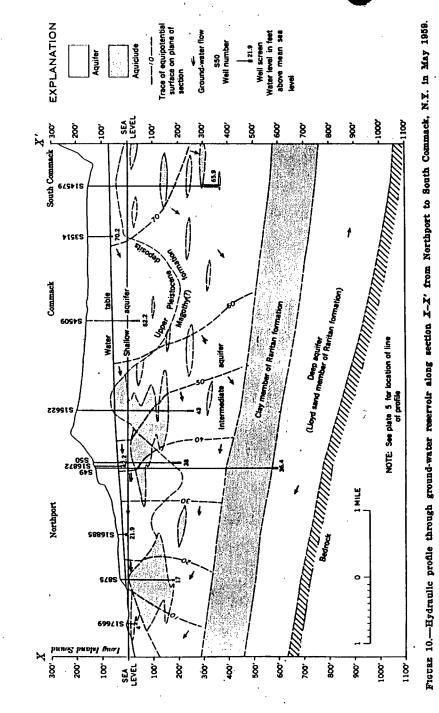


figure 10 by deflections in the equipotential lines. The contiguous clay bodies in the Pleistocene and Magothy (?) deposits form a common aquiclude.

The velocity of flow through the ground-water reservoir is as important as direction of movement, particularly with reference to the dilution and dispersal of contaminants that may move in solution in the water. The velocity is a function chiefly of permeability, hydraulic gradient, and porosity as indicated by the following formula:

$$V = \frac{Pl}{7.48_p},$$

in which,

V =velocity, in feet per day;

P=coefficient of permeability, in gallons per day per square foot;

I = hydraulic gradient, in feet per foot;

p = porosity, in percent.

*Computations based on the foregoing formula—using values for permeability, natural hydraulic gradients, and porosity, which seem appropriate to the water-bearing units of the Huntington-Smithtown area—suggest the following range in natural velocities.

•	Feet per day
Pleistocene deposits	0.8-1.1
Magothy (?) formation	
Lloyd sand member	

The indicated differences in velocity result chiefly from differences in overall permeability among the three units. However, maximum natural velocities in the more permeable facies of all these units may be far greater than those just indicated, but minimum velocities may be considerably less. Moreover, pumping from wells creates cones of depression in which hydraulic gradients are greatly increased over those prevailing under natural conditions. Consequently, velocities in the vicinity of pumping wells may be as much as 100 times greater than velocities under natural gradients.

DISCHARGE

Water discharges naturally from the ground-water reservoir by evapotranspiration, the flow of coastal springs, submarine discharge into salt-water bodies, and effluent seepage into streams draining into Long Island Sound. Water is also discharged artificially by by pumping from wells.

The annual rate of total evapotranspiration on Long Island is estimated to range from about 22 to 26 inches on the basis of studies by Williams (1940, pl. 2), Meyer (1944, p. 239-281), and Thornthwaite (1939). Of the total evapotranspiration, part is water from precipitation that is intercepted and returned to the atmosphere before

reaching the water table, but part is water discharged directly from the ground-water reservoir where the water table is at or near the land surface. Evapotranspiration directly from the ground-water reservoir occurs in most of the areas of high water table, meadow and swamplands, and tidal marshes that fringe the shore of Long Island Sound. These areas are estimated to cover a total of about 7 square miles and to have an average evapotranspiration rate of 24 inches annually, or about 8 mgd.

Numerous springs discharge at the edge of the salt water along the shore of Long Island Sound. The flow of individual springs where it can be observed is generally less than 10 gpm, but the aggregate discharge from such springs may amount to several million gallons a day. All this discharge apparently issues from the shallow aquifer. Submarine discharge by upward leakage from the intermediate and deep aquifers probably takes place mostly in Long Island Sound and in contiguous bays and harbors. Such submarine outflow cannot be observed or measured directly but probably makes up the bulk of the water naturally discharged from the ground-water reservoir north of the water-table and piezometric divides.

A considerable volume of ground water also discharges naturally by seepage into effluent streams such as Cold Spring Brook, Nissequogue River, Mill Creek, and Stony Hollow Run, which all flow into Long Island Sound. The aggregate flow, most of which represents ground-water discharge, from gaged streams draining the project area was estimated to average about 30 mgd during the period of record (table 4).

Artificial withdrawal of water from the ground-water reservoir takes place through pumping or flowing wells. In 1957 gross withdrawals for all purposes within the project area were estimated to average about 14.7 mgd. Of the water withdrawn, an estimated average of 10.5 mgd was returned to the ground through recharge wells, sumps, cesspools, and septic tanks. About 2.5 mgd of used ground water was delivered directly to Long Island Sound and the Nissequogue River through sewage-disposal systems. Presumably, the residual of 1.7 mgd was used consumptively in industrial processes and sprinkler irrigation.

PUMPAGE

Ground-water withdrawals from wells in the Huntington-Smithtown area have steadily increased with the rapid growth of population and industry during the past two decades. In 1960 practically all water requirements for public supply and for industrial, domestic, and agricultural purposes were supplied from ground water. Most of the pumpage data given in this report were obtained from the New

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York State Water Resources Commission, but some data were obtained from miscellaneous private sources. A complete record of pumpage for public supply in Suffolk County had been maintained by the commission since 1950. Most of the pumpage is metered, but some is estimated. Industrial pumpage includes withdrawal for industrial, commercial, institutional and estate needs. Records for this pumpage are not as accurate as those for public supply, and therefore the annual pumpage per well is generally estimated. A partial record of agricultural pumpage is also filed with the commission.

During the period 1932-57, average withdrawals from public-supply systems in the Huntington-Smithtown area increased from about 1.5 mgd in 1932 to 8.8 mgd in 1957 (fig. 11). The rate of withdrawals from public-supply systems has increased so sharply since about 1949, that by 1957 about 75 percent of the population of the project area was supplied by public-supply systems. In 1957, some 14 municipally owned and privately owned public-supply systems served the Huntington-Smithtown area, and the average withdrawals from individual systems ranged from an estimated 0.1 to 3.7 mgd. Metered

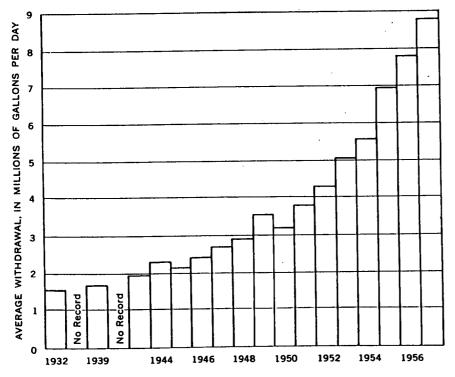


FIGURE 11 .- Average withdrawal from public-supply systems in the Huntington-Smithtown area, 1932-57.

or estimated pumpage during 1957 for public-supply wells is shown graphically in plate 6. Most of the draft was from wells screened in Pleistocene deposits at depths ranging from 40 to 504 feet below land surface, but at the same time the draft from wells screened in the Magothy (?) formation was substantial. In 1957, only two public-supply wells, S8 and S1313, were drawing water from the deep aquifer (Lloyd sand member). The average withdrawal for public supply in 1957 was 8.8 mgd, of which 5.5 mgd or 63 percent was pumped from Pleistocene deposits, 3.0 mgd or 35 percent from the Magothy (?) formation, and about 0.3 mgd or 2 percent from the Lloyd sand member.

Domestic wells supplied an estimated 25 percent of the population of the project area during 1957 and accounted for an average withdrawal of about 2.2 mgd based on an estimated daily use of 76 gallons per person (Hoffman, 1959, p. 35).

The industrial pumpage during 1957 was estimated to average about 2.7 mgd of which 0.7 mgd, or 26 percent, was ultimately returned to the ground-water reservoir by means of diffusion wells or sumps. The Northport Veterans Hospital and the Kings Park State Hospital account for about 60 percent of the industrial pumpage. Of the withdrawal for industrial use during 1957, about 2.0 mgd was pumped from the Magothy (?) formation, 0.6 mgd from the Pleistocene deposits, and 0.1 mgd from the Lloyd sand member.

Pumpage classified under agricultural use in the project area is used almost entirely for irrigation. Most of this withdrawal takes place during June, July, and August,4 although irrigation may start as early as May and at times may continue into October. In 1957 the agricultural pumpage reported to the New York State Water Resources Commission for the Huntington-Smithtown area was 140 million gallons, which was used to irrigate about 713 acres. However, a total farmed acreage of 1,852 acres, most of which is irrigated, had been reported previously to the commission. The estimated agricultural pumpage for the total reported irrigated acreage in 1957 was about 364 million gallons. Owing to the sprinkler method of irrigation which is practiced in the area, most if not all of the water used for irrigation is probably dissipated into the atmosphere by evapotranspiration.

The distribution of pumping during 1957 from public-supply and industrial wells at principal centers of pumping is shown in figure 9. As indicated, centers of pumping are fairly evenly distributed in Huntington, but the bulk of the pumping in Smithtown is concen-

⁴ New York State Water Resources Commission, 1958, Report of Long Island groundwater withdrawal for 1957 and 10-year summary of water consumption from all sources: New York State Water Resources Comm., duplicated rept., p. 5.

trated in the Kings Park area. In Huntington it is noted that several centers of moderately heavy withdrawal are located near the southern extremities of Cold Spring and Huntington Harbors and also in the vicinity of Centerport and Northport Harbors. However, the draft from wells at these centers at present (1960) rates has not resulted in any apparent overdevelopment of the ground-water reservoir nor is there any evidence of sea-water encroachment. Withdrawals in the Huntington-Smithtown area averaged about 14.7 mgd in 1957 and are listed by major use, as follows:

	Witharawais
Ues	(mgd)
Public supply	8.8
Domestic 1	2. 2
Industrial 1	2. 7
Agricultural 1	1.0
Total	14. 7

¹ Estimated.

SURFACE WATER

The larger streams and some of their smaller tributaries are all perennial. These streams are characterized by relatively uniform discharge throughout the year and by flood peaks of small amplitude and short duration. These characteristics result chiefly from (1) the relatively uniform distribution of precipitation through the year, (2) the highly absorptive character of the soil and substratum, (3) the gentle slope of the land surface, and (4) the large storage capacity of the ground-water reservoir.

The average monthly and yearly discharge of the four largest streams whose drainage basins are largely in the Huntington-Smithtown area is shown in table 4. The total runoff of these streams from the project area averaged about 11 billion gallons a year (30 mgd) during the period of record. In estimating the average runoff for Cold Spring Creek, only the part of the drainage basin which lies in Huntington was used. The estimated average discharge of Mill Creek and Stony Hollow Run is based on occasional miscellaneous measurements since 1953. For the Nissequogue River a continuous record of streamflow has been maintained since 1943. Information on the flow of other streams in the project area is not available. These streams, however, probably do not contribute significantly to the total runoff, as their drainage basins are relatively small.

Most of the discharge of streams in the project area is derived from effluent seepage from the ground-water reservoir or ground-runoff. Direct or overland runoff is normally insignification

except after periods of intense or heavy rainfall. For example, Legette (Paulsen, 1940, p. 529-552) estimated that overland runoff from the heavy rainfall which accompanied the hurricanes of September 1938 was only 1.4 to 2.3 percent of the total storm precipitation. These estimates were based on a study of an area in southern Long Island where land slopes are relatively low and overland runoff would be at a minimum. Using a method similar to that of Leggette based on the relation of the total precipitation of a given storm to stream discharge, the author computed overland runoff in the Nissequogue River to be 3 to 4 percent of the rain which fell on the drainage basin during the hurricanes of August and September 1954. In this storm the somewhat higher overland runoff may be attributed to the relatively steeper land slopes which prevail in this basin.

At present (1960) little or no use is made of streams as a source of water for public supply and for industrial or domestic purposes. However, all streams in the project area are used considerably for esthetic and recreational purposes and for the propagation of fish and wildlife. For example, Cold Spring Brook provides water for the New York State Fish Hatchery located a short distance upstream from the head of Cold Spring Harbor, and three ponds on the stream provide recreational facilities (Sawyer, 1954, p. 20). The Nissequogue River, which is the largest stream on Long Island, was used extensively in the 19th century for milling and light navigation. At present, it is used almost exclusively for recreational purposes and for the conservation of fish and wildlife (Brice, 1952, p. 29). The Nissequogue is considered to be one of the best sport fishing streams of Long Island.

CHEMICAL QUALITY

Except in a few localities near the shoreline, the chemical quality of both surface and ground water is generally excellent. Concentrations of the common chemical constituents are relatively low (table 5) and well within the maximum limits of standards prescribed by the U.S. Public Health Service (1946) for potable water supplies. Some of these standards are given in parts per million (ppm), as follows:

	Ppm		Ppm
Iron (Fe) and manganese		Sulfate (804)'	250
(Mn) combined	0. 3	Dissolved solids:	
Magnesium (Mg)	125	Desirable maximum	500
Chloride (Ci)	250	Permitted maximum	1,000

Iron is present in most of the ground water but is generally in concentrations of less than 0.3 ppm. The maximum observed concentration was 1.5 ppm in a water sample taken or pril 30, 1959,

NOTE.—As discussed on page D45, only about 4 mgd of the total withdrawal of 14.7 mgd represents a net loss of ground water, as the remainder recharges the groundwater reservoir through cesspools, pits, and wells.

average discharge of streams continuously or occasionally gaged in the Huntington-Smithtown -Summary of

[Figures furnished by Surface Water Branch, U.S. Geol. Survey]

						Αve	Average discharge (cfs)	parge (ct	⊛					Average	Average yearly
Stream	Period of record	Jan.	Feb.	Mar.	Apr.	Мау	June	July	Aug.	Sept.	0ct.	Nov.	Dec.	discharge for period of record (cfs)	runon for period of record (million gallons)
					İ	Ì	T	Ť							
Cold Spring Brook at Cold Spring			•	C	4	67	4.7	4.6	4.9	4.6	4.6	4.9	4.9	4.9	1 412
Harbor Nissequoque River near Smith-	1920-09	1 6			-		43.4	40.2	40.6	38.	38.4	41.2	41.5	13.1	9, 979 731
Mill Creek	1953-59													1.3	307
Stony Hollow Run	1958-08													51.6	11, 429
Total			-						-	-	-	-			
of a resident of the second of	standard for the mart of the drainage basin which ites in Huntington (2.6 square miles of the total of about 7.3 square miles at the gaging station).	art of the	drainage	basin w	hich lies	in Hunt	ington (2.	.6 square	miles of	the total	of abou	t 7.3 squ	re miles	at the gagin	g station).

USGS, U.S. Geol. Survey; USBS, U.S. Bur. Standards. Water-Dearing unit: L. Ludyu sand memori; L.; Leestern (1908). U.S. Geol. Survey; USBS, U.S. Bur. Standards. deposits]	ter-Silica Iron Cal-Magne So Potas Bicar Sul-Chlor-Fiuo- Ni- Dis-Hard- ring (SiO ₂) (Fe) cdum stum dium stum bonate fate fide ride trate solved ness as [t 3]	80 0.02 2.0 0.9 4.0 0.8 7 2.0 4.0 0.0 1.0 31 8 9 9 1 1 2 2 2 9 5 5 2 5 5 2 5 5 2 5 7 2.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7
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8GS, U.S. Geol	Date of collection	Oct. 10, 1932 May 1, 1934 Dec. 7, 1933 Oct. 10, 1932
	Depth of screen	488-588 177-202 713-728 308-348 553
[Agency making analysis:	Map Depth of coordi- screen	88 89 80 80 80 80 80 80 80 80 80 80 80 80 80
[Адепсу	Well	88 831 649 851

from well S16137. Water samples from wells S27, S49, and S8251 also had iron concentrations of 0.35, 0.45 and 0.32 ppm, respectively. The median range and concentration of iron in the ground water of the project area are summarized in table 6. Manganese is found only in trace concentrations in the ground water. Generally, iron and manganese do not presently (1960) constitute a problem in the use of ground water for public supply or other purposes.

TABLE 6.—Iron concentration, chloride concentration, hardness as CaOOs and variation in pH of ground water in the Huntington-Smithtown area, 1956-59

	Pleistocene deposits	Magothy (7) formation	Lioyd sand member	All aquifers
Iron (concentration	1		·
Number of analyses	19 0. 00–1. 5 0. 08	0. 00-0. 32 0. 04	0. 00-0. 60 0. 15	0. 00–1. 5 0. 08
Chlorid	e concentrati	on		
Number of analyses	1-26	18 1-810 6	2-1, 700 4	60 1–1, 700 7
Hardi	tees as CaCO)s		<u> </u>
Number of analyses(ppm) Range(ppm) Median(ppm)	20 8-108 24	18 7–36 16	9 4–28 8	47 4–108 20
Vari	ation in pH		•	,
Number of analyses Range Median	20 5. 4-7. 2 6. 3	18 5. 7-7. 2 6. 2	6. 2-6. 8 6. 3	5. 4-7. 2 6. 3

The median concentration of chloride in the ground water ranges from 4 to 8 ppm (table 6). In the central part of the area the maximum observed chloride concentration was 26 ppm on September 10, 1958, in well S16794. Chloride concentrations exceeding 100 ppm have been observed at several near-shore localities, however (fig. 12).

The hardness as CaCO_s of the ground water is generally less than 100 ppm. The median and the range of hardness are shown in table 6. The water becomes progressively softer with depth. This softening probably can be attributed to ion exchange during downward percolation of water through clayey aquicludes.

The pH of the ground water ranges from 5.4 to 7.2 (table 6) and is generally less than 7.0. Because of this fact the water is some-

The dissolved-solids content of the water is generally less than 150 ppm.

TEMPERATURE

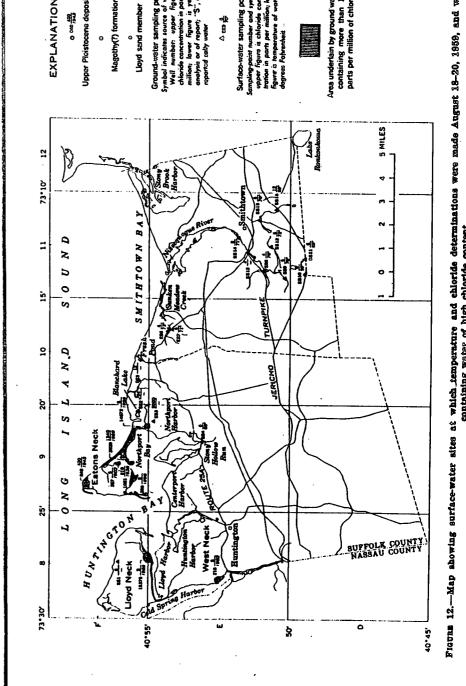
Occasional temperature measurements of water from wells and streams in the Huntington-Smithtown area have been made by the U.S. Geological Survey and also by well drillers. The maximum and minimum temperatures of ground water observed in the project area are 72° and 49°F, respectively. The greatest seasonal and annual range in ground-water temperatures occurs in the shallow part of the ground-water reservoir at depths less than 50 feet below land surface. The observed range of temperature in this depth interval is from 50° to 72°F. At depths greater than 50 feet, the temperature ranges from only 49° to 56°F and generally decreases with depth. For example, at well S16794, 45 feet deep, two observations indicated a range from 53° to 62°F. Seven temperature measurements taken at well S50 at Northport, 348 feet deep, indicated a range from 50° to 51°F. Three measurements at well S9 on West Neck, 570 feet deep, ranged from 56° to 56.3°F.

Several temperature measurements of water from streams in the project area were made by the U.S. Geological Survey on August 18-20, 1959. The water temperatures observed ranged from 59° to 80° and averaged 70°F. Temperatures taken at several points along the Nissequogue River ranged from 59° to 72°F. The air temperature at the time of observation ranged from 78° to 93°F. The water temperature in the river is related to air temperature, to stream velocity, and to volume of ground-water inflow at or near the site of the temperature measurement. The location of surface-water measuring points and the temperatures observed are given in figure 12.

CONTAMINATION

Although the natural chemical quality of the water is generally excellent, local contamination of the water supply has resulted from the activities of man. The sources of contamination in areas inland from the shoreline are domestic and industrial wastes, fertilizers, and salts used for deicing and dust control on roads. In near-shore areas, sources of contamination are salt water pumped from tidewater for washing sand and gravel and sea water which has encroached the aquifers adjacent to the shorelines.

The most useful chemical criteria for contamination are the chloride and nitrate ions, whose presence in the water in greater-thannormal concentrations is indicative of the source and the degree of



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contamination. The water from wells and streams normally contains less than 15 ppm of chloride and 5 ppm of nitrate; greater concentrations of these constituents are generally indicative of contamination.

Except for the sewage disposal systems of Kings Park State Hospital and of the villages of Huntington and Northport which discharges into tidewater, practically all domestic sewage and liquid industrial waste are disposed of in cesspools, septic tanks, leaching basins, and sewage treatment filter beds from which contaminating effluent ultimately reaches the water table and thence moves into streams. The effects of this type of contamination are only slightly perceptible in most of the ground and surface water of the project area at present (1960). These effects, however, are expected to increase as population and home density increases and if central sewage disposal systems are not installed. The highest chloride concentrations observed in the ground water of the central part of the project area were 22 ppm in well S1811 and 26 ppm in well S16794. These wells tap water at depths of 10 and 45 feet, respectively. These higher-than-normal chloride concentrations are attributed to contamination from cesspool effluent. Also, during the past 15 years, the increasing use (Task Group Report, 1959) of synthetic detergents (syndets) for household use and the disposal of these in cesspools and in septic tanks has resulted in a small but perceptible concentration of syndet residual, commonly the surfactant (wetting agent) alkyl benzene sulfonate (ABS), in the shallow ground water and in streams. Concentrations of 1 ppm or greater of syndets cause foam to form on water when it is agitated (Flynn, 1958). In higher concentrations, syndets impart a taste to water that is disagreeable to sensitive individuals. The toxicity of syndets to the human system is not yet well established. Syndets, at least in trace concentrations, are probably present in some shallow wells and in some streams. The concentrations are generally only barely detectable by available analytical techniques. For example, among analyses of water samples from 36 shallow wells in the village of Smithtown by C. W. Lauman & Co., Inc., in 1959, only one sample contained as much as 0.1 ppm of syndet. Additional analyses for syndets were made by the New York State Department of Health on samples taken on April 30, 1959, from well S16137 at South Huntington and on July 1, 1958, from wells S15514 and S15515 at East Northport. The syndet concentration in well S16137 was less than 0.03 ppm and in wells S15514 and S15515 was less than 0.05 ppm.

Fertilizers used to increase crop yields are also a source of contamination to the shallow ground water. For example, potassium chloride, ammonium nitrate, calcium sulfate, and other inorganic

salts applied to the land in fertilizer form are partly dissolved by downward percolating water and ultimately increase, at least locally, the concentration of these salts in the ground water. This source of contamination has never been a serious problem in the project area, and it is gradually decreasing with suburban development and the consequent reduction in cultivated and cropped land.

Sodium chloride for winter-ice control and calcium chloride for dust control on highways are used in substantial quantity in Suffolk County; combined they probably total on the order of about 0.8 pound per year per linear foot of highway (Hoffman and Spiegel, 1958, p. 16). These salts largely dissolved by infiltrating water ultimately reach the water table and contaminate the shallow ground water. As the volume of salts introduced in this form is diluted by a far greater volume of ground water, the resulting contamination from this source is relatively insignificant, except perhaps locally.

Local contamination of ground- and surface-water supplies in nearshore areas may result from the practice of using salt water pumped from adjacent salt-water bodies for washing and sorting sand and gravel at quarries. Commonly, the spent wash water is discharged on the land surface or wasted into artificial ponds above sea level. Seepage or overflow from such salt-water ponds results in local contamination of the ground water and streams. This practice is common in sand and gravel quarries in the Northport area adjoining Long Island Sound and Northport Bay. Blanchard Lake near Northport (pl. 1), which intersects the water table and is nominally fresh, is occasionally contaminated in this manner. For example, in August 1956 the lake water contained 19 ppm of chloride, but in February 1959 the chloride concentration was 94 ppm. This increase was apparently caused by salt water used for sand and gravel washing and discharged on the land surface in the area south of the lake. The salt water moved into the lake presumably by overland flow, by ground-water flow, or by both means.

In the Huntington-Smithtown area, sea-water encroachment is apparently not a general problem nor does available evidence suggest that encroachment is in progress at present (1960), except perhaps locally on Eatons Neck. However, if the trend toward sharply increasing withdrawals (fig. 11) continues as in the past decade, salt-water tongues may eventually be expected to invade, at least locally, the coastal parts of the ground-water reservoir, and possibly to contaminate near-shore wells. Existing wells that are particularly susceptible are located in and near centers of moderately heavy withdrawal near the southern extremities of Cold Spring, Huntington, Centerport, and Northport Harbors (pl. 6). In 1960, the chloride concentrations in water pumped from wells in these areas was less

than 16 ppm. Apparently, the developed aquifers beneath and adjacent to these salt-water embayments are at least partly protected by beds of relatively impervious clay and silt in the Pleistocene and Cretaceous deposits and in similar harbor-bottom deposits of Recent age. Eventually, however, increasing withdrawals and consequent reduction in fresh-water head in these areas could result in local sea-water encroachment. Concurrent dredging in the harbors and removal, wholly or partly, of the protective cover of harbor-bottom deposits would also facilitate encroachment.

Salt-water encroachment and contamination have occurred locally on Eatons Neck and may be aggravated if withdrawals substantially increase over those currently (1960) prevailing. This possibility was demonstrated by a pumping test conducted in July 1958 at well S1081. Prior to pumping, a chloride concentration of 505 ppm was reported in the water from the well. After a 34-hour interval of pumping, the chloride concentration of the water increased to 810 ppm. Chloride concentrations exceeding 500 ppm also are reported in well S848 on Eatons Neck after long periods of pumping, although the average concentration is less than 500 ppm. Two other wells, S3554 and S1039, located near well S848, but somewhat farther inland, yield water in which the chloride concentration is 35 and 4.9 ppm, respectively. All these wells are screened in the shallow aquifer in the Magothy (?) formation. The progressive landward decrease in the chloride concentration in the ground water substantiates the conclusion that contamination takes place from the seaward direction.

Chloride concentrations exceeding 100 ppm have been observed in the ground water of several areas fringing the shores of Eatons, Lloyd, and West Necks. This ground water probably became salty under natural conditions. Pumping, however, may induce further encroachment toward the interior parts of these peninsulas, as has been observed at wells S848 and S1081. Areas underlain by such salty ground water are shown on figure 12. The extent of these areas is approximated from available data and possibly may be greater or smaller than indicated. In some instances areas underlain by salty water have been inferred from wells in which drillers reported salty water. Around much of the coastal fringe of Eatons Neck, salty ground water occurs at varying depths in the groundwater reservoir. At well S2020 (pl. 4) a chloride concentration of 1,700 ppm was measured in a water sample from the Lloyd sand member. This sample probably represents the quality of the water near the base of the Lloyd at a depth of 605 feet below sea level. It is therefore inferred that salty water may occur in the Lloyd sand member beneath much, if not all, of the interior part of Eatons Neck. by water has also been found in the upper Pleistocene deposite and in the Magothy (?) formation in wells S266, S267, S848 and S1081 in the coastal zone of Eatons Neck (fig. 12). Apparently in the interior part of Eatons Neck, fresh ground water occurs only in the upper Pleistocene deposits and in the Magothy (?) formation, possibly as a fresh-water lens floating on deeper salty water (pl. 4).

Along the southeastern shore of Lloyd Neck, salty ground water was reportedly obtained from well S15375 at a depth of 231 feet in the Magothy (?) formation. However, well S16918, drilled about 200 feet north of this well, is screened at a depth of 145-150 feet in fresh water in the Magothy (?) formation. Salty ground water also probably occurs at shallow depth beneath tidal marshes fringing the northwestern part of Lloyd Neck. With these exceptions, the ground water in the upper Pleistocene deposits and Magothy (?) formation is probably fresh in most of Lloyd Neck. Water from wells S1794 and S4466, in the Lloyd sand member beneath the southwestern part of Lloyd Neck, contained chloride concentrations of only 2 and 4 ppm, respectively, in 1959. Presumably water in the Lloyd sand member is also fresh under most, if not all, of Lloyd Neck.

A small zone of salty ground water occurs in the shallow aquifer on the western short of West Neck, adjoining Cold Spring Harbor (fig. 12). Here, salt water is reported at well S216 (Veatch and Bowman 1906, p. 293) from 14 to 100 feet below land surface. Fresh water was found beneath a layer of clay, which lies at a depth of 100-158 feet. Apparently, the occurrence of salty water at this site is limited to coarse upper Pleistocene deposits underlying a small sand spit.

CONCLUSIONS

The ground-water reservoir underlying the Huntington-Smithtown area is recharged naturally by an estimated average of 147 mgd of water whose sole source is precipitation. In 1957, an average of about 14.7 mgd was pumped from this reservoir. About 10.5 mgd of the gross withdrawal in 1957 was returned artificially to the reservior so that a net of only about 4.2 mgd was used consumptively or wasted. Thus, the net withdrawal is relatively small in comparison with the estimated average rate of natural recharge. Moreover, water levels in observation wells for which long-term records are available have remained relatively stable during the past two decades and do not suggest any downward trend attributable to pumping at present (1960) rates.

A very substantial increase in the net rate of withdrawal from the ground-water reservoir could be sustained if the new centers of pumping were properly located with respect to existing well fields. The distribution of existing centers of moderately heavy withdrawal in 1960, shown in plate 6, suggests that new wells should generally be at least 2 or more miles inlar bouth) from

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tidewater and a mile or more from existing installations to minimize effects of interference. Also, withdrawals exceeding those in 1960 from existing wells and well fields near tidewater, particularly from wells near the southern extremities of Cold Spring and Huntington Harbors, and in the vicinity of Centerport and Northport Harbors (pl. 6) are not advocated. Increased draft from these well fields could eventually lead to local overdevelopment and to contamination by sea-water encroachment from these salt-water embayments. On the other hand, the present draft on the ground-water reservoir in the central and southern parts of Huntington, and particularly in Smithtown, is relatively light. Consequently, these parts are potential areas for development of supplies from new wells and well fields.

At present (1960), the danger of sea-water encroachment is more immediate on Eatons Neck than elsewhere in the project area. This area is nearly surrounded by open salt-water bodies and apparently is underlain by salty ground water in most of the intermediate aquifer and in all the deep aquifer. Fresh water sustained by local recharge apparently occurs only as a lens in the shallow aquifer and possibly in the upper part of the intermediate aquifer. There is some evidence of local encroachment at near-shore wells on Eatons Neck, and if pumping were increased, the degree of contamination would probably also intensify.

Salt water used for washing sand and gravel is locally wasted into ponds or on the land surface at pits and quarries near tidewater, such as those north of Northport. This practice may result in local contamination of fresh ground water near the points of disposal.

Contamination of the shallow ground water of Long Island and Suffolk County by synthetic detergents and other domestic waste has been a problem since the end of World War II and appears to be becoming increasingly serious owing to rapid suburban growth and development. Although available data suggest that the problem has not yet (1960) become very serious in the Huntington-Smithtown area, adequate provisions should be made to cope with it in the future. Partial solutions would include (1) development and marketing of nonstable synthetic detergents which degrade completely in their movement through the soil and in ground water, (2) the location of new wells for public-water supply in zones where the density of population and industrial development is low and likely to remain so in the future, (3) the setting aside of specific zones of restricted industrial and residential development to protect the environs of future public water-supply well installations, (4) the withdrawal of public-water supplies from wells in the deeper part of the Magothy (?) formation in zones where population and industrial development are already relatively dense, and (5) construction of sanitary sewer systems in areas currently containing a high density of population or industry and likely to grow in the future.

Geologic and hydrologic knowledge of the ground-water reservoir in 1960, although substantial, is far from complete. In particular, information is needed on the pressure heads, water quality, and hydraulic properties of deeper parts of the Magothy (?) formation (intermediate aquifer) and of the Lloyd sand member (deep aquifer). The need for this information is particularly critical on Lloyd and Eatons Necks and in the shoreline areas, where the Lloyd may constitute the only or chief available source of fresh water. In inland areas, such information on the Lloyd is needed to evaluate more closely the paths of water movement and also to evaluate the availability of water in the deeper parts of the ground-water reservoir. From an economic standpoint and because of its relative immunity to contamination from domestic and industrial waste, the deeper part of the Magothy (?) formation, in particular the basal gravelly zone, needs to be more closely appraised with respect to its potential for future water development. This zone is only lightly pumped but no doubt would sustain many wells of relatively high yield. The needed information on both the Magothy (?) and the Lloyd would be provided by test drilling at selected sites and under close supervision so as to obtain a maximum of geologic and hydrologic data.

To monitor seasonal and annual changes in ground-water storage, an adequate program of water-level measurements in observation wells should be maintained on a continuing basis. To detect seawater encroachment, water in wells and well fields near tidewater should be sampled periodically for chloride content. To observe and to judge future trends in contamination of the ground-water reservoir by domestic and industrial waste, water samples from both shallow and deep wells should be analyzed periodically for syndets, chloride, and nitrate. Occasionally, more comprehensive chemical analyses of water samples from representative wells and from streams should be made.

Ground-water conservation presently practiced by means of diffusion wells and recharge basins, in which used cooling water pumped from wells and runoff from precipitation is returned to the ground, is well conceived and should be continued and expanded wherever physical and economic conditions permit. The maintenance of these structures should also be improved wherever feasible to permit optimum ground-water recharge. In addition, as a measure of water conservation as well as of storm-runoff disposal, the construction of recharge basins and diffusion wells should be linked wherever practicable to construction of new roads, buildings, and parking lots.

TABLE 7 .- Records of selected wells in the Huntington-Smithtown area [See fig. 2 for location of wells]

Map coordinates: Number and letter indicate grid square on map, figure 2.

Owner: WD, Water District; 8CWA, Suffolk County Water Authority; USGS,
United States Geological Survey.

Altitude of reference point: Reference point is land surface at most wells except as
indicated in "Remarks" column. Altitude by spirit levelling given to nearest tenth
of a foot; others interpolated to nearest 10 feet from topographic maps.

Water-yielding unit: uP, upper Pleistoceme deposits; Ma, Mannetto gravel; M, Magothy(?) formation; L, Lloyd sand member of the Raritan formation; Pu, Pleistocene
deposits undifferentiated.

Water level: Measurement reported by driller given to nearest foot. Measurements by Geographical Survey given to nearest tenth of a foot.

Use: A, abandoned; Dom, domestic; Ind, Industrial, institutional or estate; Irr, Irrigation; O, observation; PS, Public supply, T, test hole.

Remarks: a, Well log published in New York Water Power and Control Commission Bull. GW-4 (U.S. Geol. Survey, 1938). b, Well log published in New York Water Power and Control Commission Bull. GW-9 (Roberts and Brashears, 1945). c, Welling published in New York Water Power and Control Commission Bull. GW-31 (New York State Water Power and Control Comm., 1952). d, Well number as published in U.S. Geol. Survey Prof. Paper 44 (Veach and Bowman, 1906).

			,			ance Bea				a.	18 18 18 18 18 18 18 18 18 18 18 18 18 1		Wa	iter level	
Well	Map coordinates	Owner	Location	Year completed	Diameter (inches)	Altitude of reference point above mean sea level (feet)	Total depth (ft)	Screen setting (feet)	Water-yielding unit	Pump capacity (gpm)	Specific capacity (gpm per it of drawdown)	Use	Depth below reference point (feet)	Date	Remarks
58 59	8E 8E	SCWA Seminary of the Immaculate	Huntington Lloyd Harbor.	1926 1930	10 10-6	5 112. 9	588 570	488-588 805-565	L	25		P8 Ind	Flowing 99. 6	May 13, 1959	a. Reference point 8 ft below grade.
B28	8E	Conception. South Hunting- ton WD.	South Hunt- ington.	1926	13	156.4	240	128-174	uР		7	0	60.1	Мау 13, 1959	a. Reference point 3 ft below grade.
829	8E	don w.D.	do			159. 5	277	227-277	uP			PS	93.1	May 13, 1959	a. Reference point at grade.
831 648	9E 10E	Green Lawn WD. U.S. Veterans	Centerport Northport	1928	18 12-8	10 125. 0	245 763	173-202 733-763	nP L	450 150	17	PS Ind	Flowing 86.8	May 21, 1959	a. Reference point at grade.
850	10E	Administration.	do	1933	16	141.5	348 153	308-348	M	250		Ind PS	103. 4	Aug. 21, 1959	Do.
865 870	11E 11E	Kings Park State	Smithtown Kings Park	1929 1935	10 12-8	33 120.4	490	462-478	uP M	750	10	Ind	93. 2	Мву 21, 1959	a. Reference point 7 ft below grade.
8202	8E	Hospital.	Huntington		12	69.3	600		L			0	24.1	Jan. 5, 1960	a. Reference point at grade.
8203	9D	Dix Hills WD.	Dix Hills		10	203. 5	259		uP		 	PS	127.8	Oct. 23, 1953	Do.

706	81310	8E	SCWA	Huntington	1956	8	5	58	33–56				PS	2	March 1956	Replacement for original well S1310.
461 0-	81313 81811	8E 12D	USGS	Lake Ron- konkoma.	1925	10 114	59. 1	570 10	470–570 7–10	L uP			PS O	3.6	Jan. 5, 1960	Replacement for similar well S1811. Reference point at grade.
<u>.</u>	S1812 S2978 S3012	9E	doSCWANorthport Water	Nesconset Northport Northport	1929 1941	134 18-12 16	69. 0 26. 5 25	39 270 174	36-39 227-267 144-174	uP M uP	722 590	- -	O PS PS	22.0 +2.8 Flowing	Jan. 5, 1960 Oct. 27, 195	Do. Do.
ģ	S3514	10E.	Works Co. USGS	Commack		30	158. 1	98		uP			0	88.8	Jan. 5, 1960	Reference point 3.3 ft above grade.
	S3800 S4145	10E.	SCWA	Kings Park Smithtown	1944 1925	12 8	170 70	170 190	143-164	uP uP	200 20		PS PS	130	April 1944	
	S4184	10E.	Water Works. Indian Head	Branch. Indian Head	1945	12	145	162	136–162	uP	780	31	PS	93	July 3, 1945	c
	84268	10E.	Water Co. USGS	Kings Park	1945	4	111.1	75	70-75	uP			0	59.2	Jan. 5, 1960	Reference point at grade.
	S4667	11E.	Forest Brook	Smithtown	1946	8	60	68	5 8-6 8	uP	50		PS	31	July . 1946	i
	S4827	9E	Water Supply. USGS	Greenlawn	1946	4	216. 2	199		uР			0	156. 6	Jan. 5, 1960	ft above grade.
	S5068	9E	Greenlawn WD	Centerport	1947	20-12	73. 6	197	151-188	M	633	22	PS	31. 6	May 26, 1959	c. Reference point 5 ft below grade.
	S6172	11E.	Forest Brook	Smithtown	1947	4	60	57	37-43	uP	15		PS	26	May 1947	
	89279	8E	Water Supply.	Cold Spring	1951	12	50	257	214-251	M	1, 735	47	PS	19	July 21, 1951	c
	S9550		John T. Murtha Indian Head	Harbor. Nesconset Indian Head	1952	4 12	150 120	127 147	126-147	uP uP	10 1,000		PS PS	90	June 1952	-
	S11105	9E	Water Co. Northport Water Works Co.	Northport	1953	20–10	173. 4	545	469-517	uP	1,400	31	PS	145. 2	Feb. 4, 1959	Reference point 1 ft below grade.
	S11803	9E.	Greenlawn WD	Greenlawn	1954	12	172.1	259	164-217	uP	1,700	79	PS	99.2	Мау 26, 1959	
	S11810	11E.	. scwa	Manor. Smithtown	1954	12	35. 7	296	144-161	uP	450	6	PS	6.0	May 26, 1959	
	811891	10E.	Smithtown	do	1954	12	70	98	76-98	uP	1,000	22	PS	24	Nov. 1954	
	S12079	9D_	Water Co., Inc. South Hunting- ton WD.	Melville	1955	20	145	602	363-399, 409-445	M	1, 200	50	PS	70	June 1955	



TABLE 7.—Records of selected wells in the Huntington-Smithtown area—Continued [See fig. 2 for location of wells]

						3 n c e				a	E G		Wa	ter level	
Well	Map coordinates	Owner	Location	Year completed	Diameter (inches)	Altitude of reference point above mean sea level (feet)	Total depth (ft)	Screen setting (feet)	Water-yielding unit	Pump capacity (gpm)	Specific capacity (gpm per ft of drawdown)	Use	Depth below reference point (feet)	Date	Remarks
S12130	8E	SCWA	Cold Spring	1954	12	69. 6	307	263-302	M	1, 200	77	PS	34.4	Oct. 19, 1956	·,
812137 813248	8E	do	Harbor. Huntington Kings Park	1954 1955	8 12	10 162. 5	62 196	36-62 139-164	uP uP		12	PS PS	121.6	May 26, 1959	Reference point 7 ft below grade.
813876	ì	South Hunting-	Cold Spring	1956	20	120	298	246-298	M	1,000	38	PS	56	Aug. 1956	it below grade.
614521	9E	ton WD. Greenlawn WD	Greenlawn	1956	18	202.8	552	459-496, 527-552	M	1,500	86	PS ·	142.2	May 26, 1959	Reference point at grade.
814579	10D	Greenlawn WD	South Com- mack.	1957	18	156.1	514	455-507	M.	1, 200	62	PS	91.3	May 26, 1959	Reference point 1 ft below grade.
S14613 S14675-T	8E 8E	SCWAdo	Huntington	1956 1956	8	5 220	60 595	35-58	uP			PS T	Flowing		5. 0. 0. 0.
814828	8E	do	Station.	1956	16-12	221.8	510	353-369, 378-399, 433-454, 483-504	uP	1, 500	222	PS	175.6	June 12, 1956	
S15514	10E	Northport Water Works Co.	East North-	1958	20-12	200.7	680	533-593	M	1, 500	71	PS	161.7	May 6, 1959	Reference point 1 ft below grade.
S15515 S15532	10E 12E	do Dan and Henry	do St. James	1958 1957	20-12 10	200.6 103.4	369 196	317-357 181-196	M uP	1,300 500	16	PS Irr	160. 9 54. 1	May 6, 1959 Aug. 18, 1959	Do. Do.
S15622	10E	Wicks. J. F. Rottkamp	East North-	1957	10	205. 6	457	437-457	М	450		Irr	162.6	May 6, 1959	Reference point at grade.
S15746	. 11D	SCWA	port. Hauppauge	1957	16	64.5	133	85-126	uР	750	62	PS	23.1	May 26, 1959	Reference point 2 ft below
615776	8E	do	Huntington Station	1957	16–12	231.0	508	438-501	uP	1,500	221	PS	188. 6	Aug. 1, 1957	grade.

															-	
S16049	9D	Dir Hills WD	Dix Hills	1958	16	195.8	328	266-328	uP	1,000	90	PS	135	May	1958	Reference point at grade.
816129	10E	SCWA	Kings Park	1958	16–10	158.7	569	416-450, 505-547	M	1,500	78	PS	120.0	May :	26, 1959	Reference point
S16137	8E	South Hunting-	South Hunt-	1958	20	160	602	540-602	uP	1,400	46	PS	104	July	1958	grade.
		ton WD.	ington.	1957	4	158. 2	604	180-185	uР			0	61.8	May	13, 1959	Reference point
S16137T	8E	do	do	1907	"	100.2	•••	100 100						•	•	2 ft above grade.
816873	9D	USGS	Half Hollow	1958	11/4	133. 2	72	69- 72	Pu			0	43.7	May :	21, 1959	Reference point at grade.
S16876	8E	do	Lloyd Harbor.		11/4	53.7	57	15-18	uP uP			A O	4. 5 51. 6		29, 1958 6, 1959	Do. Reference point
S16880	11E	do	San Remo	1958	11%	56.8	71	66-69	uP		1	1	01.0	шау	u, 1509	1.5 ft above grade.
S18075-T	10D	SCWA	Deer Park	1959		115	628					т				grade.
	_			<u> </u>	l				<u>. </u>	<u> </u>		<u> </u>		<u> </u>		

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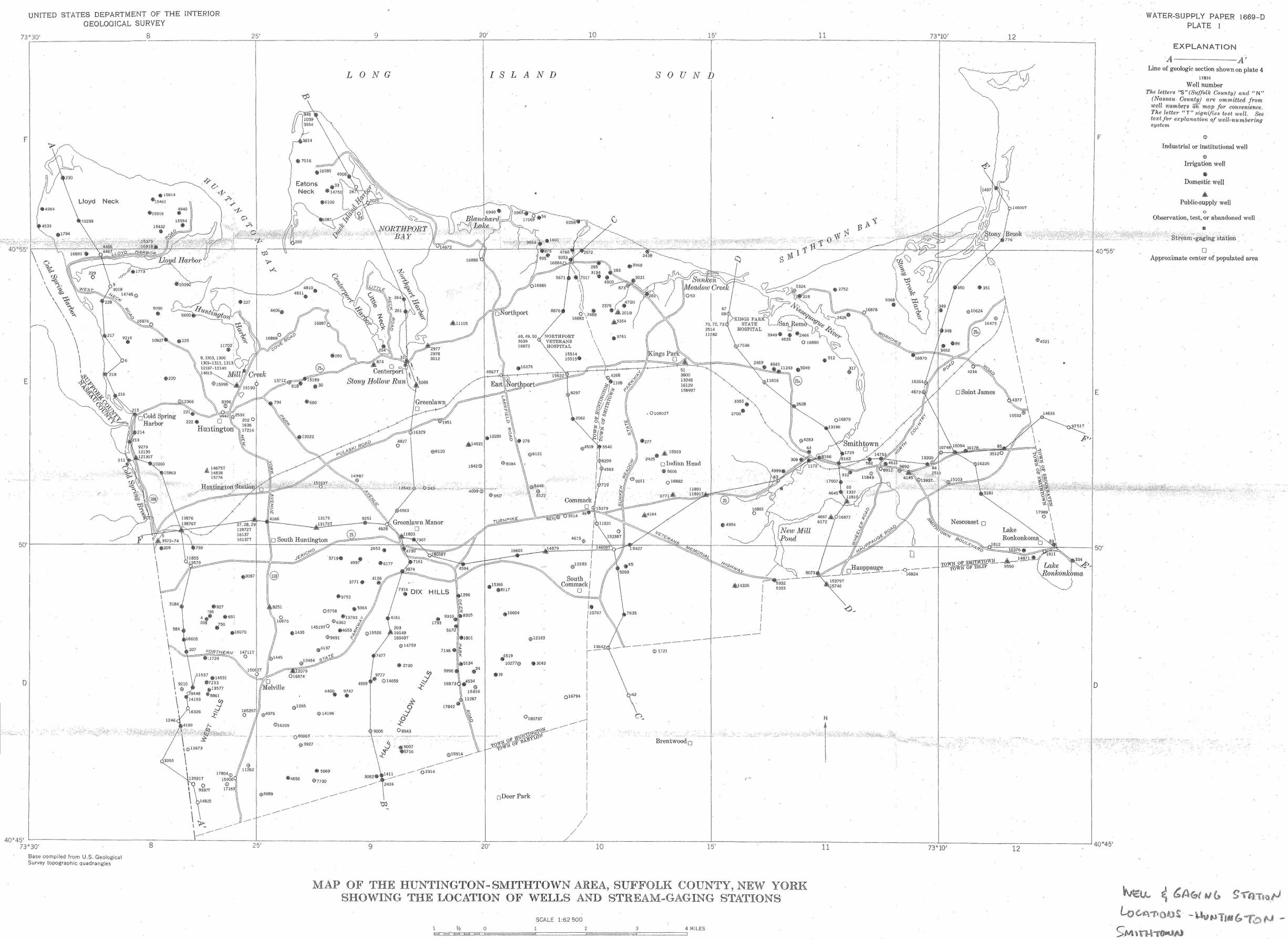
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Water-Transmitting

Properties of Aquifers on Long Island, New York

By N. E. McCLYMONDS and O. L. FRANKE

HYDROLOGY AND SOME EFFECTS OF URBANIZATION ON LONG ISLAND, NEW YORK

GEOLOGICAL SURVEY PROFESSIONAL PAPER 627-E

Prepared in cooperation with the New York

State Department of Conservation, Division of

Water Resources; the Nassau County Department

of Public Works; the Suffolk County Board of

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WATER-TRANSMITTING PROPERTIES OF AQUIFERS ON LONG ISLAND, NEW YORK

By N. E. McClymonds and O. L. Franke

ABSTRACT

Data on the aquifers of Long Island, N.Y., have been collected for the past 30 years as part of a series of studies conducted by the U.S. Geological Survey in cooperation with New York State and county agencies. Since 1900, more than 50,000 wells have been constructed on Long Island. For at least 2,500 of these wells, some information was recorded that is of value in interpreting the hydrologic character of one or more of the four principal aquifers—the upper glacial, the Jameco, the Magothy, and the Lloyd. Although the data for the deeper aquifers—the Magothy and Lloyd—are concentrated largely in the western part of Long Island, enough information is available to make a general interpretation of the hydraulic conductivity and the transmissivity of all aquifers throughout most of the island.

Estimates of the average hydraulic conductivity of the reened interval in the aquifers were obtained by multiplying specific capacity of the well by the inverse of the well-treen length and by a constant which was estimated from the Theis nonequilibrium formula. Based on the estimated average hydraulic conductivities of different lithologies in many screened intervals, a value of hydraulic conductivity was assigned to each lithology in each aquifer. Using these values, an average aquifer hydraulic conductivity was obtained from drillers' logs, and maps of average hydraulic conductivity were developed for each aquifer on Long Island. Maps of total aquifer transmissivity were developed by combining maps of average aquifer hydraulic conductivity and total aquifer thickness.

The estimated average hydraulic conductivity values obtained in this study were about 1,700 gpd per sq ft (gallons per day per square foot), for the upper glacial aquifer, about 1,300 gpd per sq ft for the Jameco, about 420 gpd per sq ft for the Magothy, and about 360 gpd per sq ft for the Lloyd. Average transmissivity values were about 200,000 gpd per ft (gallons per day per foot) for the upper glacial aquifer, about 100,000 gpd per ft for the Jameco, about 240,000 gpd per ft for the Magothy, and about 90,000 gpd per ft for the Lloyd.

INTRODUCTION

BACKGROUND, PURPOSE, AND SCOPE OF THE WATER-BUDGET STUDY

Long Island, which extends from the southeastern part of the mainland of New York State eastward about 120 miles into the Atlantic Ocean, has a total area of about 1,400 square miles (fig. 1). Kings and Queens Counties, which are part of New York City, occupy slightly less than 200 square miles of the western part of the island and have a combined population of about 4.5 million people. Nassau and Suffolk Counties, with areas of about 290 and 920 square miles, respectively, had a population of about 2.5 million people in 1965.

Although Kings and Queens Counties obtain most of their water supply from New York City's system, which is derived from parts of the Delaware and Hudson River basins in upstate New York, Nassau and tapping the underlying ground-water reservoir. Because of present large demands on the local ground-water system and because of the prospect of increased demands as the population of Long Island continues to grow, knowledge about the hydrologic system—with special emphasis on that needed for water conservation and management purposes—is a matter of vital concern now as well as in the future.

Considerable information on the water resources of Long Island is available as a result of more than 30 years of study by the U.S. Geological Survey in cooperation with New York State and county agencies. Although the studies met many of the needs for information on specific problems and areas of Long Island, more quantitative information about the island-wide hydrologic system and the relations between the various components of the system is needed for water-management purposes. To provide that information, a comprehensive water-budget study presently is being made by the Geological Survey in cooperation with the New York State Department of Conservation, Division of Water Resources; the Nassau County Department of Public Works; the Suffolk County Board of Supervisors; and the Suffolk County Water Authority.

The major objectives of the water-budget study are (1) to summarize and interpret pertinent existing in-

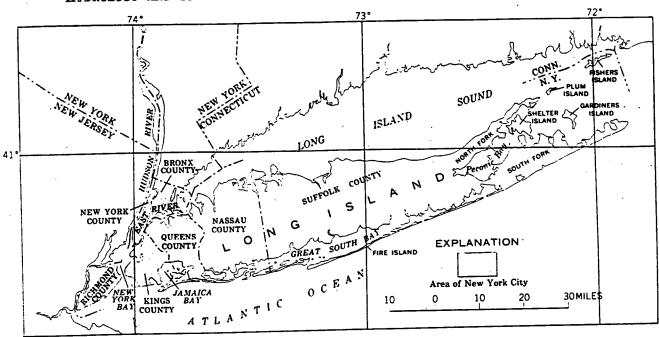


FIGURE 1.—Location and political boundaries of Long Island.

formation about the hydrologic system of Long Island and (2) to fill several gaps in the knowledge of the hydrologic system. The results of these studies are being published in a series of coordinated reports. In some of the reports, including this one, information is developed for all of Long Island; in others the primary area of concern is limited to Nassau and Suffolk Counties.

PURPOSE AND SCOPE OF THIS REPORT

To evaluate, by means of mathematical or physical models, the response of a ground-water flow system to either natural or manmade changes in the hydrologic regimen, a knowledge of the three-dimensional variation in transmissivity is essential. In addition, a knowledge of transmissivity is necessary to calculate the quantities of ground water flowing in the subsurface. Calculating subsurface flow is particularly important on Long Island because a significant percentage of the total natural outflow of water from the hydrologic system occurs as subsurface outflow to the sea.

The purpose of this report is (1) to summarize existing information on the transmissivity and hydraulic conductivity of Long Island's aquifers and (2) to prepare, for the first time, preliminary maps showing the estimated average hydraulic conductivity and transmissivity of each of the principal aquifers.

LOCATION AND GENERAL GEOGRAPHIC FEATURES OF THE AREA

Long Island is bounded on the north by Long Island Sound, on the east and south by the Atlantic Ocean, and on the west by New York Bay and the East River

(fig. 1). Several smaller islands are included in the political boundaries of Long Island; the larger of these are Shelter, Gardiners, Fishers, and Plum Islands. The total land area of Long Island is about 1,400 square miles, including the smaller islands within the political boundaries of the island. The four counties—King Queens, Nassau, and Suffolk—have areas of 78 square miles, 115 square miles, 291 square miles, and 922 square miles, respectively.

Several barrier beaches extend along the south shore of Long Island; the longest of these is Fire Island in southern Suffolk County. The northern and eastern coast lines of the island are indented by deep bays that form excellent harbors. Peconic Bay, which is about 30 miles long, divides the eastern end of the island into two long, narrow peninsulas that are locally referred to as the north and south forks.

PHYSIOGRAPHIC FEATURES

Most of the major features of the present-day topography of Long Island (fig. 2) are related to Pleistocene glaciation. The most prominent physiographic features are (1) the east-trending hills in the northern and central parts of the island and their eastward extensions, which form the north and south forks, (2) the gently sloping plain that extends southward from the hills, (3) the deeply eroded headlands along the north shore, and (4) the barrier beaches along the south shore.

The Harbor Hill Moraine forms the northern line of east-trending hills, which extend from Kings County northern Nassau County and eastward to the north for The Ronkonkoma Moraine forms the southern line of

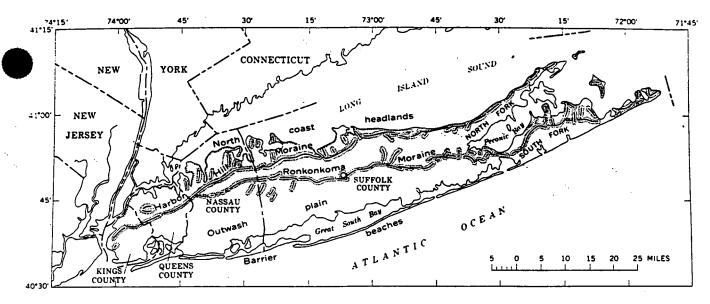


FIGURE 2.—Major physiographic features.

hills and extends from northwestern Nassau County eastward across central Suffolk County to the south fork. These moraines were deposited at the southernmost extension of the glacial ice sheets and have an altitude of about 200 to 300 feet in most of Long Island. The Ronkonkoma Moraine has a maximum altitude of about 400 feet in western Suffolk County.

The moderately even, gently sloping surface that exnds southward to the south-shore bays from the Haror Hill Moraine in Kings and Queens Counties and from the Ronkonkoma Moraine in Nassau and Suffolk Counties is underlain by glacial outwash deposits. This surface has an altitude of about 100 to 150 feet along its inland border and slopes southward at about 20 feet per mile.

The eroded headlands along the north coast are composed mainly of sand, gravel, and clayey till of glacial origin. Wave action has steepened the slopes and cut into the headlands, so that nearly vertical bluffs now exist, some as much as 100 feet high. The bays and harbors of the western part of the north shore were formed during glacial advance and retreat (fig. 2).

Along the south shore, waves and ocean currents formed offshore bars (barrier beaches). Sand and silt, as well as organic deposits, have partly filled and are continuing to fill the shallow bays behind the barrier beaches.

ACKNOWLEDGMENTS

Most of the lithologic and well data in this report were obtained from the files of the New York Water Resources Commission. The authors wish to express their thanks to Walter G. Waterman, associate engineer of the Water Resources Commission, and his colleagues or making these records available. The report was prepared under the immediate supervision of B. L. Foxworthy, former hydrologist-incharge, and Philip Cohen, hydrologist-in-charge of the Geological Survey subdistrict office on Long Island; and under the general supervision of Ralph C. Heath and Garald G. Parker, former district chiefs, and Robert J. Dingman, district chief, U.S. Geological Survey, Albany, N.Y.

HYDROGEOLOGIC SETTING

The hydrogeologic setting of Long Island was described in comprehensive reports by several authors (Veatch and others, 1906; Fuller, 1914; Suter and others 1949). In addition, the geology and hydrology of several smaller areas of Long Island were studied in detail by Isbister (1966), Lubke (1964), Lusczynski and Swarzenski (1966), Perlmutter and Geraghty (1963), Pluhowski and Kantrowitz (1964), and Swarzenski (1963). The general hydrologic situation on Long Island was reviewed by Cohen, Franke, and Foxworthy (1968).

Long Island is underlain by consolidated bedrock (fig. 3), which in turn is overlain by a wedge-shaped mass of unconsolidated sedimentary materials. The top of the bedrock, which is at or near the land surface in the northwestern part of the island, slopes to the southeast to a depth of about 2,000 feet below sea level in south-central Suffolk County (fig. 4). The average slope of the bedrock surface is about 65 feet per mile.

The materials that overlie the bedrock and constitute the ground-water reservoir consist of Pleistocene deposits and Cretaceous unconsolidated fluvial and deltaic deposits composed of gravel, sand, silt, clay, and mixtures thereof. The Cretaceous deposits were moderately

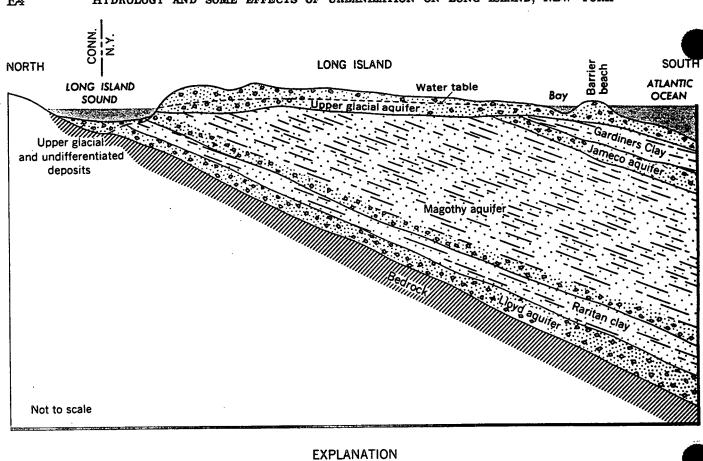


FIGURE 3.—Generalized geologic section showing relative positions of four principal aquifers.

Sandy clay, clayey sand and silt

Gravel

to deeply eroded by streams and glaciers, and therefore, the Pleistocene materials were deposited on an irregular surface that locally was characterized by moderate relief. Data from the numerous wells drilled in Kings, Queens. Nassau, and northwestern Suffolk Counties are sufficient to define the general outlines of the preglacial valleys. In central and eastern Suffolk County, however, the valleys are less well defined.

The upper surface of the Cretaceous deposits generally is below sea level except in several areas in north-eastern Nassau and northwestern Suffolk Counties. In all but a few small areas the Pleistocene deposits cover the Cretaceous deposits.

Pertinent information concerning the principal hydrogeologic units of Long Island's ground-water reservoir is summarized in table 1.

Ground water in the uppermost part of the zone of

saturation on Long Island, mainly in the upper glacial aquifer but locally also in the Magothy aquifer, is generally under water-table (unconfined) conditions. Artesian (confined) conditions predominate in most of the other parts of the ground-water reservoir of Long Island, where the saturated deposits are overlain by silty and clayey layers of low hydraulic conductivity. Locally, the hydraulic head in the confined aquifers ranges from 30 to 40 feet below the water table in the central part of the island to nearly 20 feet above the water table near the margins of the island. At places along the north and south shores and on the barrier beaches, the head in the Lloyd aquifer is high enough to cause wells that tap the aquifer to flow.

Sand

Consolidated rock

The most significant confining layers in the grow water reservoir are the Raritan clay, which overlies but Lloyd aquifer; the many discontinuous clay and silt

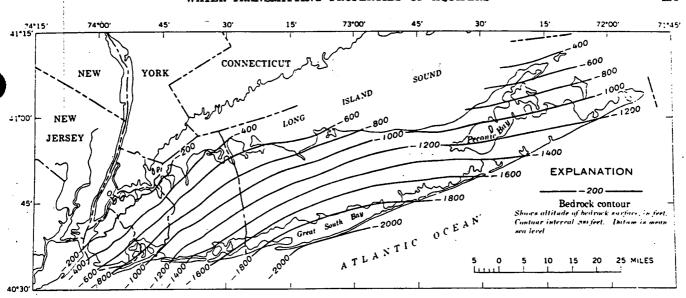


FIGURE 4.—Contour map of the bedrock surface. (Modified from Suter and others, 1949, pls. 8, 9, and 10.)

Table 1.—Summary of the rock units and their water-bearing properties, Long Island

System	Series	Geologic unit ¹	Hydro- geologic unit	Approximate maximum thickness (feet)	Depth from land surface to top (feet)	Character of deposits	Water-bearing properties
	Holocene	Recent deposits: Artificial fill, salt marsh deposits, stream alluvium, and shoreline deposits.	Recent deposits	50	0	Sand, gravel, clay, silt, organic mud, peat, loam, and shells. Colors are gray, brown, green, black, and yellow. Recent artificial-fill deposits of gravel, sand, clay, and rubbish.	Permeable sandy beds beneath barrier beaches yield fresh water at shallow depths, brackish to salty water at greater depth. Clay and silt beneath bays retard salt-water encroachment and confine underlying aquifers. Stream floodplain and marsh deposits may yield small quantities of water but are generally clayey or silty and much less permeable than the underlying upper glacial aquifer.
Quaternary	Pleistocene	Upper Pleistocene deposits	Upper glacial aquifer	600	0-50	Till (mostly along north shore and in moraines) composed of clay, sand, gravel, and boulders forms Harbor Hill and Ronkonkoma terminal moraines. Outwash deposits (mostly between and south of terminal moraines, but also interlayered with till) consist of quartzose sand, fine to very coarse, and gravel, pebble to boulder sized. Glaciolacustrine deposits (mostly in central and eastern Long Island) and marine clay (locally along south shore) consist of silt, clay, and some sand and gravel layers; includes the "20-foot clay" in southern Nassau and Queens Counties. Colors are mainly gray, brown, and yellow; silt and clay locally are grayish green. Contains shells and plant remains, generally in finer grained beds; also contains Foraminifera. Contains chlorite, biotite, muscovite, hornblende, olivine, and feldspar as accessory minerels; "20-foot clay" commonly contains glauconite.	Till is poorly permeable; commonly causes perched-water bodies and impedes downward percolation of water to underlying beds. Outwash deposits are moderately to highly permeable; specific capacities of wells tapping them range from about 10 to more than 200 gpm per It (gallons per minute per foot) of drawdown. Good to excellent infiltration characteristics. Glaciolacustrine and marine clay deposits are mostly poorly permeable but locally have thin, moderately permeable years of sand and gravel; generally retard downward percolation of ground water. Contains fresh water except near the shore lines. Till and marine deposits locally retard saltwater encroachment.
		Gardiners Clay	Gardiners Clay	300	50-400	Clay, silt, and few layers of sand and gravel. Colors are grayish green and brown. Contains marine shells, Foraminifera, and lignite; also locally contains glauconite. Altitude of top generally is 50-80 feet below mean sea level. Occurs in Kings, Queens, and southern Nassau and Suffolk Counties; similar clay occurs in buried valleys near north shore.	Poorly permeable; constitutes confining layer for underlying Jamero aquifer. Locally, sand layers yield small quantities of water.
		Jameco Gravel	Jameco aquifer	300	50-550	Sand, fine to very coarse, and gravel to large-pebble size; few layers of clay and silt. Gravel is composed of crystalline and sedimentary rocks. Color is mostly dark brown. Contains chlorite, biotite, muscovite, hornblende, and feldspar as accessory minerals. Occurs in Kings, Queens, and southern Nassau Counties; similar deposits occur in buried valleys near north shore.	Moderately to highly permeable; contains mostly fresh water, but brackish water and water with high fron content occurs locally in southeastern Nassau and southern Queens Counties. Specific capacities of wells in the Jameco range from about 20 to 160 gpm per ft of drawdown.

See footnotes at end of table.

TABLE 1.—Summary of the rock units and their water-bearing properties, Long Island—Continued

System	stem Series Geologic unit ¹		Hydro- geologic unit	Approximate maximum thickness (feet)	Depth from land surface to top (feet)	Character of deposits	Water-bearing properties	
		— Une	onformity —					
Tertiary (?)	Pliocene(?)	Mann	etto Gravel	(Commonly included with upper glacial aquifer.)	800	0-120	Gravel, fine to coarse, and lenses of sand; scattered clay lenses. Colors are white, yellow, and brown. Occurs only near Nassan-Suffolk County border near center of island.	Highly permeable, but occurs mostly above water table. Excellent infil tration characteristics.
4.		Magothy (?) Formation 2		Magothy aquifer	1, 100	0-600	Sand, fins to medium, clayey in part; interbedded with lenses and layers of coarse sand and sandy and solid clay. Gravel is common in basal 50-200 feet. Sand and gravel are quartrose. Lignite, pyrite, and iron oxide concretions are common; contains muscovite, magnetite, rutile, and garnet as accessory minerals. Colors are gray, white, red, brown, and yellow.	Most layers are poorly to moderately permeable; some are highly permeable locally. Specific capacities or wells in the Magothy generally rangirom 1 to about 30 gpm per ft or drawdown, rarely are as much as 8 gpm per ft of drawdown. Water is unconfined in uppermost parts, else where is confined. Water is generally of excellent quality but has high iron content locally along north and sout shores. Constitutes principal aquife for public-supply wells in western Long Island except Kings County where it is mostly absent. Has bear invaded by salty ground water locally in southwestern Nassau and southern Queens Counties and it small areas along north shore.
Cretaceous	Upper Cretaceous	pper	onformity ————————————————————————————————————	Raritan clay	300	70-1, 500	Clay, solid and silty; few lenses and layers of sand; little gravel. Lignite and pyrite are common. Colors are gray, red, and white, commonly variegated.	Poorly to very poorly permeable; con- stitutes confining layer for under lying Lloyd aquifer. Very few welli- produce appreciable water from these deposits.
		Raritan Formation	Lloyd Sand Member	Lloyd aquifer	500	200-1,800	Sand, fine to coarse, and gravel, commonly with clayey matrix; some lenses and layers of solid and silty clay; locally contains thin lignite layers and iron concretions. Locally has gradational contact with overlying Raritan clay. Sand and most of gravel are quartrose. Colors are yellow, gray, and white; clay is red locally.	Poorly to moderately permeable Specific capacities of wells in the Lloyd generally range from 1 to about 25 gpm per ft of drawdown, rarely are as much as 50 gpm per ft of drawdown. Water is confined under artesian pressure by overlying Rari tan clay; generally of excellent quality but locally has high from content. Has been invaded by salty grouwater locally in necks near machine, where aquifer is mostly allow and overlying clay is discontinuous. Called "deep confined aquifer in some earlier reports.
Precam- brian			onformity ———	Bedrock		0-2, 700	Crystalline metamorphic and igneous rocks; muscovite-biotite schist, gneiss, and granite. A soft, clayey zone of weathered bedrock locally is more than 100 feet thick.	Poorly permeable to virtually imper meable; constitutes virtually th lower boundary of ground-wate reservoir. Some hard, fresh water i contained in joints and fractures bu is impractical to develop at mos places; however, a few wells near th western edges of Queens and King Counties obtain water from the bedrock.

Names are those used in reports by the Geological Survey.
 The use of the term "Magothy(?) Formation" has been abandoned. The post-

lenses in the Magothy deposits; and the Gardiners Clay, which overlies the Jameco aquifer and locally overlies the Magothy aquifer. The clayey and silty layers in the Magothy aquifer become increasingly effective as confining layers with depth, particularly in the southern part of Long Island where the Magothy reaches its maximum thickness—about 1,100 feet in southern Suffolk County. Clayey beds in the upper glacial aquifer are found mainly in the northern part of the island and in parts of central Suffolk County; some are interbedded with glacial outwash deposits near the south shore.

DEFINITION OF HYDRAULIC CONDUCTIVITY AND TRANSMISSIVITY

The hydraulic conductivity, K, of material comprising an aquifer is a measure of the material's capacity to Raritan Cretaceous deposits are divided into the Magothy Formation and Matawan Group undifferentiated and the Monmouth Group undifferentiated.

transmit water. In units of meinzers, commonly used by the Geological Survey, hydraulic conductivity is defined as the rate of flow of water in gallons per day through a cross-sectional area of 1 square foot under a hydraulic gradient of 1 foot per foot at a temperature of 60° F. In field practice the adjustment to the standard temperature of 60° F commonly is ignored, and hydraulic conductivity is then understood to be related to the prevailing water temperature.

The transmissivity of material comprising an aquifer is defined as the number of gallons of water that will move in 1 day through a vertical strip of the aquifer having a width of 1 foot and having the height of the aquifer, when the hydraulic gradient is unity. It equal to the hydraulic conductivity multiplied by the

thickness of the aquifer in feet, and it is expressed by the following equation:

$$T = Km, \tag{1}$$

in which T=transmissivity of the aquifer, in gallons per day per foot,

K=hydraulic conductivity of the aquifer, in gallons per day per square foot, and m=thickness of the aquifer, in feet.

Strictly speaking, the preceding definition of transmissivity applies only to a homogeneous and isotropic aquifer. Under these ideal conditions the transmissivity is constant at all times and places within the aquifer. A generalization of this definition that is useful for defining the transmissivity of multilayered sequences in which both thickness and hydraulic conductivity vary widely in adjacent layers is

$$T = \sum_{i=1}^{n} K_i m_{i'} \tag{2}$$

in which T=total transmissivity of i layers, in gallons per day per foot,

K_i=hydraulic conductivity of the *i*th layer, in gallons per day per square foot, and
 m_i=thickness of the *i*th layer, in feet.

With reference to equations 1 and 2, the average hydraulic conductivity \overline{K} of a sequence of layers may defined as

$$\overline{K} = \frac{T}{M} \tag{3}$$

in which \overline{K} —average hydraulic conductivity of a multilayered sequence, in gallons per day per square foot, T=total transmissivity; in gallons per day per foot, and

M=total thickness of the sequence of layers, in feet.

The definitions of hydraulic conductivity and transmissivity in equations 1, 2, and 3 are strictly valid only for the hydraulic conductivity in the direction parallel to the direction of flow, which, for most of Long Island, is parallel to the bedding or stratification of the aquifers. This direction commonly corresponds to the direction of greatest hydraulic conductivity and transmissivity in nature. Thus, where the bedding is horizontal or almost so, as on Long Island, equations 1, 2, and 3 are used to define the horizontal hydraulic conductivity and transmissivity.

PREVIOUS ESTIMATES OF HYDRAULIC CON-DUCTIVITY AND TRANSMISSIVITY OF LONG ISLAND'S AQUIFERS

Previous investigators estimated transmissivity and hydraulic conductivity values for parts of individual aquifers on Long Island primarily from data derived from aquifer tests and driller's well-acceptance tests (specific-capacity tests). Pertinent data concerning the aquifer tests for which information is available are listed in table 2, and the locations of the wells that were tested are shown in figure 5. In most of the tests, it was assumed that the thickness of the aquifer tested was equal to the thickness of the material between the first well-defined clay layer below and above the screened interval or the first well-defined clay layer below the screened interval and the water table.

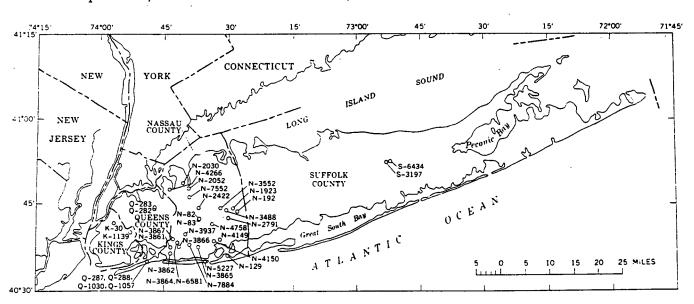


FIGURE 5.—Location of wells for which aquifer-test data are available. Data summarized in table 2.

Table 2.—Estimates of transmissivity and hydraulic conductivity of Long Island's aquifers derived from aquifer tests

Aquifer	Well	Date of test	Well discharge (gpm)	Drawdown in pumped well (feet)	Screen length (feet)	Estimated thickness of interval tested (feet)	Transmis- sivity (gpd per ft)	Hydraulic conductivity (gpd per sq it)	Source of information 1
Jpper glacial	K-30	1947 .			<u></u>		375, 000		U.S.G.S. file.
••	8-3197	Dec. 1950	460	50	20	145	190,000	1, 300	M. A. Warren and N. Lusczynski.
ameco	K-1139	June 1941 Sept. 1935	1,000	28	50	80 50	110,000 140,000 140,000	1, 400 2, 800	J. G. Ferris. U.S.G.S. file.
fagothy	N-82 N-83	Sept. 1935	1, 000	20 84	60	80	140,000	2,800	Do
	N-53 N-129	Sept. 1935 Nov. 1953	1, 220	54	50	60 80	50, 000	1000	Do.
•	N-192	Dec. 1940	530			100	50, 000 350, 000	3, 500	C. E. Jacob.
	N-1923	Aug. 1943	1, 360	70	50 55 25 20 31	100 70	60, 000 115, 000	850	Do.
	N-2030	Apr. 1946	540	87	25	32 20 50	115,000	3,600	Do.
	N-2030 N-2052	Aug. 1947	920	39	20	20	30,000	1,500	W. V. Swarzenski.
	N-2422	Oct. 1947	205	87 39 40 20 35 24 21 19		50	30,000 240,000 240,000 150,000 360,000 150,000	4,800	N. J. Luscrynski.
	N-2791	Sept. 1949	790	20	31	100	240, 000	2, 400	Do. Do.
	N-3488	July 1950	1,120	35	52 53	100 100	100,000	1, 500 3, 600	Do. Do.
	N-3552	Sept. 1950	1, 150	24	33 11	155	150,000	1,000	Do.
	N-3861 N-3862	Oct. 1952 Oct. 1952	130	21	10	45	40,000	900	Do.
	N-3862 N-3864	Oct. 1952 Oct. 1952	82 95 86 113 83	01	ii	145	40, 000 30, 000 24, 000 100, 000 80, 000	200	Do.
	N-3865	Oct. 1952	98	ĝi	10	80	24, 000	300	Do.
•	N-3866	Oct. 1952	118	21	ĩŏ	60	100,000	1,700	Do.
	N-3867	Dec. 1952	83	91 31 10 50 23	10 11	60	80,000	1, 300	Do.
	N-3937	Sept. 1952	1, 600	50	73 16 16	67	140,000	2, 100	Do.
	N-4149	Oct. 1953	140		16	180 70	300,000	1,600	Do.
	N-4150	Feb. 1954	120	9	16	70	140,000	2,000	Do.
	N-4758	Dec. 1954	1,300		62	100	220, 000	2, 200	N. M. Perlmutter and J. J. Geraghty
	N-6581	Oct. 1958	130	38	10	60	30, 000	500	N. J. Lusczynski. U.S.G.S. file.
	N-7552	Aug. 1964	1,500	114	95 62 20 84	95	140, 000 300, 000 140, 000 220, 000 80, 000	740	U.S.G.S. IIIe. Do.
	N-7884	Apr. 1967	1,000	32	62	50	60,000	1, 200 400	M. A. Warren and N. J. Lusczynski.
	S-6434	Jan. 1949	410	33	20	100 80	£0,000	600	C. E. Jacob.
loyd	Q-282	Jan. 1942 .			841 08	80 80	80,000 80,000	600	Do.
	Q-283	Jan. 1942 . Feb. 1940	2, 100		60	100	40,000 50,000 50,000 160,000	1,600	Do.
	Q-287 Q-288	Feb. 1940	2, 100			100	180,000	1, 800	Do.
	Q-200 Q-1030	Feb. 1940	2, 100	52	65	100	180, 000 160, 000	1, 600	Do.
	Q-1057	Feb. 1940	2,100			100	170,000	1,700	Do.
	N-4266	Sept. 1954	78	41	15	15	10,000	660	N. J. Lusczynski.
	N-5227	June 1955	1, 200	50	60	60	30,000	500	N. J. Lusczynski and W. V. Swarzen
	S-6434	June 1949	460	185	80	65	12, 500	200	M. A. Warren and N. J. Lusczynski.

¹ From original data in the files of the U.S. Geological Survey, Mineola, N.Y.; some interpretive results based on these data were later published.

Estimates of hydraulic conductivity by previous investigators, which were derived from specific-capacity data obtained from drillers' acceptance tests, are listed in table 3, and the locations of the wells that were studied are shown in figure 6. Usually one of two methods was used to calculate the transmissivity of part of the aquifer. The first method was developed by Theis, Brown, and Meyer (1954) for water-table aquifers. The

second method, devised by R. R. Meyer (Bentall, 1963), is also based on the method developed by Theis, but it provides a technique for estimating the transmissivity of both artesian and water-table aquifers. The hydraulic conductivity was in turn calculated by dividing the transmissivity by an estimated value of the thickness of aquifer material that was tested at the well site.

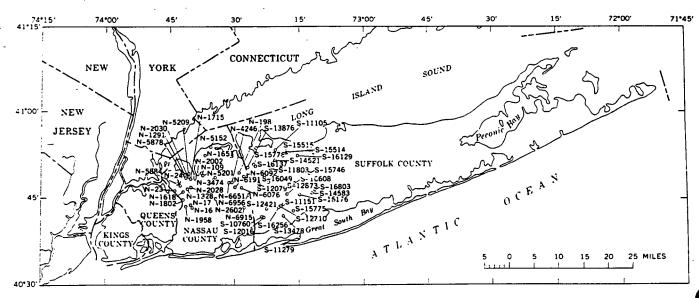


FIGURE 6.—Location of wells for which specific-capacity data are available. Data summarized in table 3.

TABLE 3.—Estimates of average hydraulic conductivity for parts of Long Island's aquifers derived from specific-capacity data

. Aquifer	Well	Screen length (feet)	Estimated thickness of nterval tested (feet)	Estimated average hydraulic conductivity of interval tested (gpd per sq ft)	Source of information
Upper glacial	S-10760	22	73	800	Pluhowski and Kantrowitz (1964, p. 16)
FF G	S-11105	48	48	900	Lubke (1964, p. 19).
	S-11151 S-11803	11 53	8 <u>4</u> 53	300 1, 500	Pluhowski and Kantrowitz (1964, p. 16) Lubke (1964, p. 19).
• •	S-12016	35	67	2, 200	Pluhowski and Kantrowitz (1964, p. 16)
•	S-12421	21	70	1, 000	Do.
	S-12710 S-12873	30 25	75 91	1, 600 1, 100	Do. Do.
	S-13478	25	70	900	Do.
	S-15746 S-15776	41 63	41 63	900	Lubke (1964, p. 19). Do.
	S-16049	62	62	1, 200 1, 000	Do.
-	S-16137	62	62	750	Do.
	S-16176 S-16608	36 30	85 88	1, 200 1, 200	Pluhowski and Kantrowitz (1964, p. 16 Do.
	S-16803	5		700	Pluhowski and Kantrowitz (1964, p. 17
Average				1, 080	, , , ₋ -
Magothy	N-16	60	150	280	Swarzenski (1963, p. 17).
	N-17	60	80	350	Do.
	N-198	50	70	1, 200	Isbister (1966, p. 24).
	N-2028 N-2030	60 25	190 80	400 440	Swarzenski (1963, p. 17). Do.
	N-3474	60	70	1, 000	Isbister (1966, p. 24).
	N-4246	50 4 0	100 100	700 540	Do.
·	N-5209 N-5876	7 0	110	540 270	Swarzenski (1963, p. 17). Do.
	N-5884	71	110	870	$\mathbf{D_0}$.
	N-6076 N-6092	62 70	70 110	1, 200 1, 100	Isbister (1966, p. 24). Do.
•	N-6191	99	130	600	Do. Do.
	N-6651	50	60	1, 100	Do.
	N-6915 N-6956	53 62	90 110	1, 100 800	Do. Do.
	S-11279	30	59	400	Pluhowski and Kantrowitz (1964, p. 18
	S-12079	72	72	550	Lubke (1964, p. 19).
	S-13876 S-14521	$\begin{array}{c} 52 \\ 62 \end{array}$	52 62,	450 750	Do. Do.
	S-14583	26	89	400	Pluhowski and Kantrowitz (1964, p. 18
	S-15514	60	60	650	Lubke (1964, p. 19).
	S-15515 S-15775	40 40	4 0 88	450 800	Do. Pluhowski and Kantrowitz (1964, p. 18
	S-16129	76	76	6 50	Lubke (1964, p. 19).
	S-16256	52	76	1, 200	Pluhowski and Kantrowitz (1964, p. 18
Average				700	·
oloyd	N-23 N-24	30 68	140 150	200 270	Swarzenski (1963, p. 15). Do.
•	N-109	70 ·	128	400	Isbister (1966, p. 20).
	N-1291	25	40	300	Swarzenski (1963, p. 15).
•	N-1328 N-1618	90 80	210 150	330 380	Do. Do.
	N-1651	80	210	300	Isbister (1966, p. 20).
	N-1715	50 50	140	210 260	Swarzenski (1963, p. 15).
	N-1802 N-1958	50 6 0	190 150	260 560	Do. Do.
	N-2002	31	80	370	Do.
	N-2602	40	230	100	Isbister (1966, p. 20).
	N-5152 N-5201	50 7 0	220 126	100 500	Do. Do.
Average			· · · · · · · · · · · · · · · · · · ·	310	

As shown in table 2, only two estimates of transmissivity derived from aquifer tests were available for the upper glacial aquifer. Neither of the two wells tested penetrates the highly permeable outwash deposits that cover most of the southern half of Long Island. The only available estimate of the hydraulic conductivity of the upper glacial aquifer based on aquifer-test data (well S3197, table 2) is from an area where morainal till and lakebed clay deposits are part of the upper glacial aquifer. Therefore, the hydraulic conductivity value obtained from this test is probably less than the average hydraulic conductivity of the aquifer.

Well K1139 in eastern Kings County is the only well tapping the Jameco aquifer for which aquifer-test data were available (table 2). The calculated transmissivity of the Jameco at this well is about 110,000 gpd per ft (gallons per day per foot). If the thickness of the aquifer that was tested is assumed to be 80 feet, the average hydraulic conductivity for that interval would be about 1,400 gpd per sq ft (gallons per day per square foot).

More estimates of transmissivity have been obtained from aquifer tests for the Magothy aquifer than for any other aquifer on Long Island (table 2). However, these estimates are of small thicknesses of the aquifer, and these materials probably include the more permeable parts of the aquifer penetrated by the well. Therefore, the estimates of average hydraulic conductivity obtained from these tests are undoubtedly higher than the average hydraulic conductivity of the whole aquifer. Most of the estimates of transmissivity of the Magothy aquifer based on data from aquifer tests range from 30,000 to more than 300,000 gpd per ft (table 2). Most values of hydraulic conductivity for the materials tested range from about 1,000 to 3,000 gpd per sq ft, and the average hydraulic conductivity is about 1,700 gpd per sq ft.

Average hydraulic conductivities of the intervals tested in the Magothy aquifer, as computed by previous investigators from specific-capacity data (table 3), are considerably less than the hydraulic conductivities calculated from aquifer-test data (table 2). Computed hydraulic conductivities of the aquifer in northern Nassau and western Suffolk Counties range from about 300 to 1,200 gpd per sq ft and average about 700 gpd per sq ft. These hydraulic conductivities were derived from estimated transmissivities divided by estimated thicknesses of the aquifer determined from lithologic logs. Because most of these wells probably were also screened in the most permeable zones, the apparent discrepancy between the average hydraulic conductivity values calculated from specific-capacity

data (700 gpd per sq ft) and the values calculated from aquifer-test data (1,700 gpd per sq ft) probably is related to the different methods of evaluation that were used rather than to actual differences in hydraulic conductivity.

Data were available for nine aquifer tests using wells that were screened in the Lloyd aquifer (table 2). Lithologic logs of the Lloyd aquifer suggest that the percentage of clay in the aquifer increases eastward. This, however, does not explain the large difference between the hydraulic conductivities calculated in several wells in Queens County and well S6434 in central Suffolk County. Lusczynski and Swarzenski (1966, p. 19) report that a reevaluation of the test for well Q1030 indicated that the average hydraulic conductivity was probably only about 500 gpd per sq ft. Furthermore, well S6434 possibly was not sufficiently developed to obtain a meaningful value for the transmissivity and hydraulic conductivity of the Lloyd aquifer from an aquifer test. The average hydraulic conductivity of the Lloyd aquifer calculated from specific-capacity data (table 3) was about 300 gpd per sq ft in Nassau County.

DERIVATION OF HYDRAULIC CONDUCTIVITY AND TRANSMISSIVITY VALUES IN THE PRESENT INVESTIGATION

One of the major objectives of this investigation v to prepare maps showing the average hydraulic conductivity and transmissivity of Long Island's aquifers. The method used to develop the hydraulic conductivity and transmissivity values mainly involved an analysis of specific-capacity and lithologic data.

THEORY

Theis and others (1954) suggested procedures for using specific-capacity data to estimate transmissivity of aquifers by means of the Theis nonequilibrium equation. A convenient form of that equation for this purpose (expressed in units used by the Geological Survey) is

$$\frac{Q}{s} = \frac{T}{114.6W(u)},\tag{4}$$

where Q/s=specific capacity of the well, in gallons per minute per foot of drawdown,

Q=discharge of the pumping well, in gallons per minute,

s=drawdown in the pumping well, in feet,

T=transmissivity of the aquifer, in gallons per day per foot,

 $W(u) = \text{well function of } u = 1.87 \text{ } r^2 \text{ } S/Tt,$

r=distance from the pumping well to the point of observation, in feet,

S=coefficient of storage, expressed as a decimal fraction, and

t=time since pumping started, in days.

The assumptions made in deriving this formula and the sensitivity of the various parameters to changes in the magnitude of other parameters are discussed at length by Bredehoeft (1963).

In this report, equation 4 was used in a modified form that was more amenable to the direct use of well data. By substituting $\overline{K}L$ for T and rearranging terms, then

$$\overline{K} = 114.6W(u) \frac{Q}{sL}, \tag{5}$$

where \overline{K} =average hydraulic conductivity of the materials opposite the well screen, in gallons per day per square foot, and L=length of well screen, in feet.

Implicit in this substitution is the assumption that the length of the well screen is equal to the thickness of aquifer material that contributes all the water to the well.

The factor Q/sL is the specific capacity of the well per foot of well screen. Because this factor takes into count the length of the well screen, its value for different wells commonly can be compared more meaningfully than can specific-capacity values, particularly where the lengths of well screens differ considerably.

Most aquifers are highly anisotropic to fluid flow, and the average hydraulic conductivity of an aquifer parallel to the bedding generally is many times greater than the average hydraulic conductivity perpendicular to the bedding. Therefore, in horizontally bedded deposits, such as those of the Long Island ground-water reservoir, most of the flow into a well commonly is derived from the materials directly opposite the well screen. Thus, the length of well screen, L, generally is a reasonable estimate of the thickness of aquifer that contributes most of the water to the well. However, because of some across-bed flow originating in beds above or below a well screen and because some wells are packed with gravel which forms a conduit for water from above and below the screen, equation 5 may give values of K that are somewhat greater than the average hydraulic conductivity of the materials opposite the well screen. In general, the error involved in using equation 5 decreases as the length of the well screen increases. Except for wells with very short screens (for example, less than 15 feet), the error in average hydraulic conductivity determination due to water entering the well from above and below the well screen is generally less than 25 percent.

To apply equation 5, a value for the factor 114.6W(u) must also be estimated. By inserting, for the variables in the expression 114.6W(u) in equation 4, the most extreme values for conditions that might occur in Long Island's aquifers, this expression was found to range from 1,500 to 2,500 and to average about 2,000. In other words,

$$\overline{K} = 2,000 \ Q/sL \tag{6}$$

is a valid approximation. Equation 6, therefore, was used to estimate the average hydraulic conductivity of the materials opposite the screened interval of most wells analyzed for this report.

As outlined in the previous paragraphs, the method of pumping-test analysis used in this report differs from the approach of previous investigators, who assumed that the tested thickness of the aquifer comprised the interval between the first "well-defined" clay layers above and below the well screen. The approach by previous investigators was not adopted because only a fraction of the wells on Long Island have geophysical logs, core data, or sufficiently detailed lithologic logs to make such an approach generally feasible on an island-wide basis. In addition, the present method has the advantage that it is quick and requires no judgment regarding the nature and extent of "well-defined" clay layers.

In the simplest case, if the lithology of the entire screened interval of each well was the same and if many wells were screened throughout all the different lithologies in an aquifer, then a compilation of values calculated from equation 6 would give a good estimate of the average hydraulic conductivity for the aquifer. In many areas, however, the screened intervals commonly are comprised of several layers of different lithology and, therefore, of different hydraulic conductivity. Jenkins (1963) developed a technique using multipleregression analysis to deal with the problem of multiple lithologies in the screened interval. In this investigation, as is described subsequently in the report, a sufficiently large number of screened intervals in each aquifer on Long Island are characterized by a single lithologic type, so that Jenkins' procedure was not used.

The lithologic descriptions of the screened intervals used in this study were derived mainly from drillers' lithologic logs. Therefore, the validity of the procedures described in the following section and the accuracy of the analysis are, at least partly, contingent upon the validity of the assumption that the drillers were consistent in their descriptions of the materials.

GENERAL PROCEDURE

Completion reports were available for about 45,000 wells on Long Island in 1967. However, most of these wells are shallow-driven well points, and no lithologic and very little hydrologic information is available for them. For the purpose of this study, data were recorded according to the format shown in table 4 for about 2,500 wells for which pertinent data were available. These wells include about 70 percent of all the wells that tap the upper glacial and Jameco aquifers for which pertinent hydrologic information is available and more than 80 percent of all known wells that tap the Magothy and Lloyd aquifers. Furthermore, these 2,500 wells included nearly all the large-yield (500 gallons per minute or more) wells on Long Island.

Table 4.—Information recorded for each well

Remarks

Information Aquifer in which well is Location of well Source of information..... Screen diameter, in inches..... Screen length, in feet Screened interval, in feet below land-surface datum. Acceptance test data:

Duration of test, in hours...

Drawdown in pumping well, in feet.
Discharge of pumping
well, in gallons per well, in gallons per minute.

Q/sL number, in gallons per minute (per) square foot.

Lithologic description(s) of the screened interval. Depth of well, in feet ...

Generally well was drilled several months prior to the test.
One of four principal aquifers on Long Island—upper glacial, Jameco, Magothy, or Lloyd.
An arbitrary numbering system was assigned to the latitude-longitude grid which permitted each well to be located within a 2½ minute rectangle. This rectangle is approximately 2.2 miles by 2.9 miles or nearly 6.4 square miles. The source of information was usually a bulletin of the New York State Department of Conservation, Division of Water Resources, the files of the Division, or the files of the U.S. Geological Survey.
Inside diameter.
The "L" of the Q/sL number.
The depths of the top and bottom of the well screen. The drawdown is generally measured at the end of the test; the "s" of the Q/sL number.

Discharge generally maintained as constant as possible throughout the test; the "Q" of the Q/sL number.

Computed from tabulated data. Complete drillers' description of the screened in-Complete Grillers' description of the screen determined and unit thicknesses.

Drilled depth is sometimes considerably greater than bottom of the well screen.

Taken mostly from topographic maps; generally accurate to within 5 leet, except where location of well is not known exactly. Approximate elevation of landsurface datum at Well loca-tion, in feet above mean Estimated from the drillers' log and regional geologic correlations. Elevation of aquifer bound-aries, in feet above or below mean sea level.

The procedures used in this report to obtain estimated values of transmissivity and average hydraulic conductivity from well data were somewhat similar to those described by Bredehoeft (1963). Although the analytical procedures varied slightly for each of the four major aquifers, hydraulic conductivity and transmissivity maps were prepared for the aquifers in accordance with the following major steps. First, the numerous lithologic descriptions of the screened intervals were grouped into three general classes: (1) Gravel, sand and gravel, and coarse sand, (2) medium to very fine sand, and sand with silt or clay layers, and (3) clay, sandy, clay, and silty clay. Initially, the lithologic de-

scriptions were divided into six classes, but the differences between the median Q/sL numbers of each of these classes were insignificant; therefore, the broader grouping was adopted. Only wells that had sufficient information to calculate Q/sL numbers were used in this phase of the analysis. The median values for the Q/sL numbers were determined for each of the three lithologic classes for each aquifer, as shown in tables 5, 7, 9, and 11.

The second step in the procedure involved assigning hydraulic conductivity values to all the materials encountered by wells that penetrated or nearly penetrated the entire thickness of each major aquifer. In this step, all wells with drillers' logs were used, whether or not Q/sL data were available. Each lithologic type in a well log was grouped into one of the three lithologic classes, each class was assigned a Q/sL number within the range set for each aquifer, and a corresponding approximate hydraulic conductivity value was calculated using equation 6. The range assigned to each lithologic class for all aquifers, except for class 1 of the Magothy and Lloyd aquifers, is purposely less than the median Q/sL values determined from the lithologic analysis of the screened intervals, partly in an effort to reflect the fact that many of the drillers' descriptions seem to overestimate the coarseness and degree of sorting of the materials and partly because the drillers commonly placed the screen in one of the most permeable intervals. Also, the use of a range provided latitude for judgment in interpreting the hydrologic significance of the individual lithologic descriptions in the drillers' logs. Finally, the range applied to each class emphasized Q/sL values from logs with the best available information, in contrast to the computed median values, which did not take into account the quality of the logs.

Inasmuch as virtually no wells were screened in the materials assigned to class 3, Q/sL and hydraulic conductivity values could not be determined for these materials. However, the very fine materials in this class contribute only slightly to the total transmissivity of the aquifers, and accordingly, the hydraulic conductivity of class 3 was assumed to be zero. The error involved in this assumption was considered to be well within the error involved in the overall computations of transmissivity.

In the third step, the average hydraulic conductivity of the materials penetrated by each well (average point hydraulic conductivity) was computed by means of equations 2 and 3. Where a well did not penetrate the entire thickness of the aquifer but did penetrate a substantial part, the computed average hydraulic conductivity was assumed to equal that of the total thickness of the aquifer at the well site.

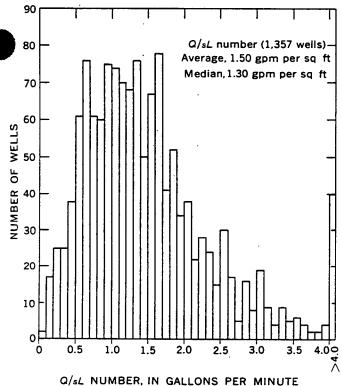
The average point hydraulic conductivities then were plotted and contoured in the fourth and final step (pls. 3, 2B, 3B, and fig. 14). Commonly, the point hydraulic conductivities ranged widely, even between nearby wells. Thus, the contour lines were drawn to follow the general trend of the plotted data; however, their positions were also influenced by available information on the areal changes in lithologic character of the aquifers in various parts of Long Island.

Regional transmissivity maps of each aquifer (pls. 1C, 2C, 3C, and fig. 15) were developed from the average hydraulic conductivity and thickness maps by multiplying the aquifer thickness by the average hydraulic conductivity at a network of points and contouring the resulting values.

HYDRAULIC CONDUCTIVITY AND TRANSMIS-SIVITY OF THE PRINCIPAL AQUIFERS

UPPER GLACIAL AQUIFER

The Q/sL numbers of wells screened in the upper glacial aquifer range from less than 0.1 to more than 4.0 gpm per sq ft (gallons per minute per square foot) (fig. 7). About three-fourths of the Q/sL numbers in figure 7 are between 0.5 and 2.5 gpm per sq ft, and



PER SQUARE FOOT

FIGURE 7.—Distribution of Q/sL numbers of wells screened in the upper glacial aquifer. (Average hydraulic conductivity of screened intervals approximates 2,000 Q/sL; see text discussion.)

the median Q/sL number for all wells tabulated is about 1.3 gpm per sq ft. Q/sL numbers greater than 2.5 gpm per sq ft were commonly determined for wells with short screen lengths (15 feet or less) of which the upper glacial aquifer (fig. 8) has a larger proportion than

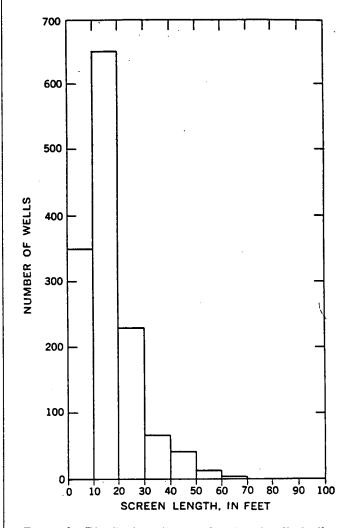


FIGURE 8.—Distribution of screen lengths of wells in the upper glacial aquifer.

any other aquifer on Long Island. (Compare figs. 8, 11, 17, and 20.) Vertical flow components probably account for an appreciable part of the discharge from these wells.

Lithologic descriptions of the screened intervals were available for most wells that were screened in the upper glacial aquifer and for which test data were available. Moreover, most of the screened intervals were either described as one lithology or the different lithologic descriptions belonged to a single lithologic class as defined earlier. The median Q/sL numbers determined for each lithologic class are listed in table 5, along with the range in Q/sL numbers assigned to each litho-

TABLE 5.—Assigned range of Q/sL numbers and calculated hydraulic conductivity values for selected lithologic classes in the upper glacial aquifer

	Lithologic class	Number	Median Q/sL num- ber of screened	Assigned range of	Calculated range of hydraulic con-	
No.	Description	of wells	intervals (gpm per sq ft)	(gpm per sq ft)	ductivity (gpd per sq ft)	
Gravel	l, sand and gravel, and coarse sand	924	1. 5	1. 0-1. 5	2,000-3,000	
Mediu:	m, fine, and very fine sand, and sand with silt or clay	408	1. 1	0. 2-0. 9	400–1, 800	
Clay,	sandy clay, and silty clay		,	1 0	.0	

¹ Assumed: see text discussion.

logic class and the corresponding range of calculated hydraulic conductivity values for each class.

Lithologic logs from about 620 wells penetrating the upper glacial aquifer were analyzed to determine point values of average aquifer hydraulic conductivity. These wells were fairly well distributed in the subareas of Long Island (fig. 9). Although in Kings, Queens, and

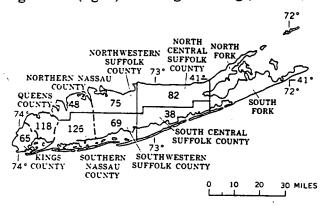


FIGURE 9.—Number of wells for which lithologic logs were available for the upper glacial aquifer in the indicated subareas in 1967.

Nassau Counties most wells that were analyzed completely penetrated the aquifer, progressively fewer wells penetrated the entire aquifer toward eastern Suffolk County.

A map showing thickness of the saturated upper glacial aquifer (pl. 14) was prepared from an unpublished map of the September 1965 water table, from well logs, and from maps and data contained in several reports (Isbister, 1966; Lubke, 1964; Perlmutter and

Geraghty, 1963; Pluhowski and Kantrowitz, 1964; Swarzenski, 1963; Julian Soren, written commun., 1968). Maps showing lines of equal average hydraulic conductivity (pl. 1B) and equal transmissivity (pl. 1C) were constructed according to the procedures outlined previously.

Noteworthy features of the map showing thickness of the saturated upper glacial aquifer (pl. 1A) are (1) the areas near the north shore of the island in which the aquifer locally is more than 500 feet thick, and (2) the increasing thickness of the aquifer in eastern Suffolk County. The great thickness near the north shore reflects buried valleys in the underlying Cretaceous deposits. Buried valleys are not as pronounced near the south shore of Long Island.

The distribution of the lines of equal average hydraulic conductivity (pl. 1B) reflects to some extent the geologic origin of the glacial material on Long Island. Average hydraulic conductivities of 2,000 gpd per sq ft and higher occur through much of the outwash-plain deposits in southern Queens, Nassau, and Suffolk Counties. Beds of lower average hydraulic conductivity (about 1,000 gpd per sq ft) are found in north-central Nassau and Suffolk Counties, where the glacial deposits contain more silt and clay.

The trends of the lines of equal transmissivity in the upper glacial aquifer (pl. 1C) are similar to the trends of the lines of equal saturated thickness (pl. 1A). This similarity reflects the fact that the variation in thickness of the aquifer is generally greater than the variation in estimated average hydraulic conductivity (pl. 1B). The highest values of transmissivity in plate 1C are associated with the greatest aquifer thicknesses, which occur in the buried valleys along the north shore of the island and in central Suffolk County.

The average thickness, hydraulic conductivity, and transmissivity of the upper glacial aquifer in subareas of Long Island, as derived from plate 1A, B, and C, are listed in table 6.

¹In numerous places on Long Island, deep channels were cut into the Cretaceous deposits and subsequently filled with Pleistocene deposits. Along the north shore, the basal deposits have been included in the Jameco Gravel by some workers (Isbister, 1966; Swarzenski, 1963) and in the upper glacial deposits by others (Lubke, 1964; Julian Soren, oral commun., 1965). In this report, all the deep buried-valley deposits along the north shore have been included in the upper glacial aquifer.

TABLE 6.—Average thickness, hydraulic conductivity and transmissivity of the upper glacial aquifer in subareas of Long Island

Subarea	Area (sq mi)	Average total thickness (feet)	Average hydraulic conductivity (gpd per sq ft)	Average transmissibity (gpd per ft)
Kings County	69 97	130	1, 400	180, 000
Queens County	97	80	1,600	120,000
Northern Nassau County	72	120	1,700	210, 000
Southern Nassau County Northwestern Suffolk	138	50	1, 900	95, 000
County SouthWestern Suffolk	135	160	1, 400	230, 000
County	110	100	1, 900	190, 000
County	254	160	1, 500	240, 000
South central Suffolk County	141	120	1, 900	230, 000
Subareas studies	1, 016	120	1,700	200, 000

JAMECO AQUIFER

About 75 wells are screened in the Jameco aquifer. Q/sL numbers of wells screened in this aquifer range from less than 0.1 to more than 4.0 gpm per sq ft, and the median Q/sL number is about 1.0 gpm per sq ft (fig. 10). About one-third of the well screens in the

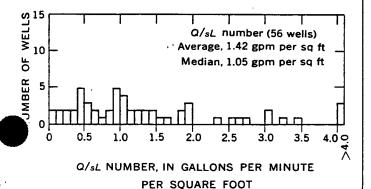


FIGURE 10.—Distribution of Q/sL numbers for wells screened in the Jameco aquifer. (Average hydraulic conductivity of screened intervals approximates 2,000 Q/sL; see text discussion.)

compilation (fig. 11) are short (15 feet or less), which suggests that vertical flow components probably contribute measurably to the discharge of such wells.

Lithologic descriptions of the screened interval were available for 56 of the wells for which test data were available. Generally the material in individual screened intervals belonged to a single lithologic class. The median Q/sL numbers determined for each lithologic class, the range in Q/sL numbers assigned to each class, and the corresponding range of calculated hydraulic conductivity values for each class are listed in table 7.

Lithologic logs describing the Jameco aquifer in 109 wells were analyzed to determine point values of average hydraulic conductivity. These wells were almost evenly distributed in the three counties in which the

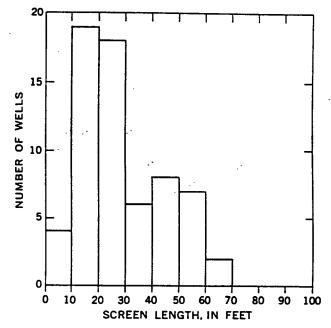


FIGURE 11.—Distribution of screen lengths of wells in the Jameco aquifer.

Jameco occurs and include more than 90 percent of the wells that completely or almost completely penetrate the aquifer. The distribution by subarea is shown in figure 12.

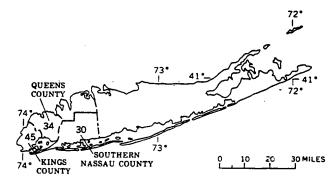
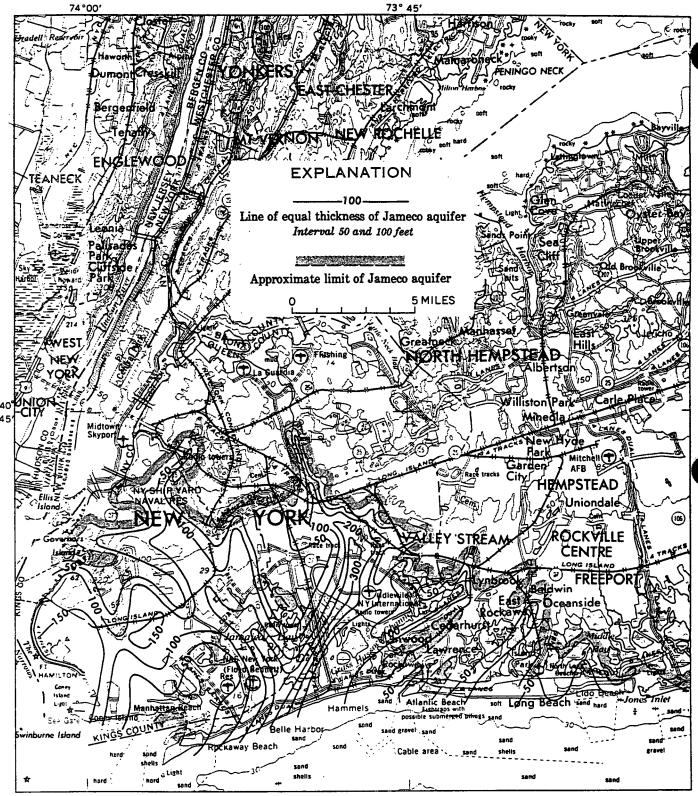


FIGURE 12.—Number of wells for which lithologic logs were available for the Jameco aquifer in the indicated subareas in 1967.

A map showing thickness of the Jameco aquifer (fig. 13) was prepared from well logs and maps and data contained in two reports (Perlmutter and Geraghty, 1963; Julian Soren, written commun., 1968). Maps showing lines of equal average hydraulic conductivity (fig. 14) and equal transmissivity (fig. 15) were constructed according to the procedures outlined previously.

The Jameco aquifer attains its maximum thickness of more than 300 feet in a buried valley cut into the underlying Cretaceous deposits in southwestern Queens County (fig. 13). Generally, the aquifer is thicker in



Base from U.S. Geological Survey, 1:250 000 series: New York, 1957; Newark, 1947

Hydrology by N. E. McClymonds, 1968; in part adapted from John Isbister (written commun., 1968), Perlmutter and Geraghty (1963), and Julian Soren (written commun., 1968)

FIGURE 13.—Thickness of the Jameco aquifer.

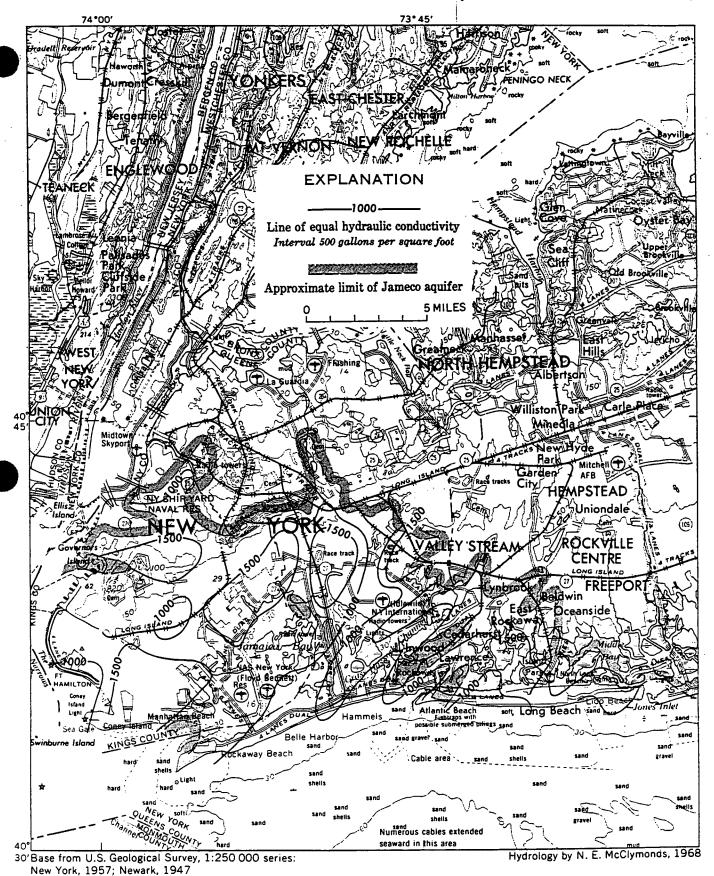


FIGURE 14.—Estimated average hydraulic conductivity of the Jameco aquifer.



FIGURE 15.—Estimated transmissivity of the Jameco aquifer.

Transmissivity lines on this map were developed by combining data from figures 13 and 14. The high degree of detail shown for the transmissivity lines is not meant to imply a high degree

of accuracy for transmissivity at any specific location. Rather it largely reflects a fairly high degree of accuracy in the information shown in figure 13 and only a moderate degree of accuracy in the information shown in figure 14.

Table 7.—Assigned range of Q/sL numbers and calculated hydraulic conductivity values for selected lithologic classes in the Jameco aquifer

	Lithologic class	Number	Median Q/sL num- ber of screened	Assigned range of Q/sL numbers	Calculated range of hydraulic
No.	Description	, of wells	intervals (gpm per sq ft)	(gpm per sq ft)	conductivity (gpd per sq ft)
1 2 2	Gravel, sand and gravel, and coarse sand	37 19	1. 1 . 9	0. 8-1. 1 0. 1-0. 7	1, 600-2, 200 200-1, 400
3	layers. Clay, sandy clay, and silty clay			, 0	0

¹ Assumed; see text discussion.

central and eastern Kings County than in southeastern Queens and southwestern Nassau Counties.

The computed average hydraulic conductivity of the Jameco aquifer (fig. 14) generally is slightly more than 1,000 gpd per sq ft. However, in several small areas near the northern boundary of the aquifer, the average hydraulic conductivity is about 1,500 gpd per sq ft. These areas with more permeable material probably reflect the somewhat coarser materials deposited in the narrower part of the buried valley.

Because the estimated average hydraulic conductivity of the Jameco aquifer shows very little areal variation, the gross pattern of the lines of equal transmissivity (fig. 15) closely reflects the pattern of the thickness map (fig. 13). The maximum transmissivity is about 300,000 gpd per ft and occurs in southwestern Queens County.

The average thickness, hydraulic conductivity, and ransmissivity of the Jameco aquifer in subareas of long Island, derived from figures 13, 14, and 15, are listed in table 8. The greatest average thickness and greatest average transmissivity of the Jameco aquifer occur in Kings County, although the maximum transmissivity occurs in Queens County.

Table 8.—Average thickness, hydraulic conductivity, and transmissivity of the Jameco aquifer in subareas of Long Island

Subarea	Area (sq mi)	Average total thickness (feet)	Average hydraulic conductivity (gpd per sq ft)	Average transmissivity (gpd per 1t)
Kings County Queens County Southern Nassau County	60 28 14	95 80 35	1, 300 1, 200 1, 400	120, 000 100, 000 50, 000
Three subareas	102	80	1, 300	110, 000

MAGOTHY AQUIFER

Q/sL numbers of wells screened in the Magothy aquifer range from less than 0.1 to 3.2 gpm per sq ft (fig. 16). This compilation includes more than 85 percent of all wells screened in the Magothy aquifer for which test data are available. More than 90 percent of the Q/sL numbers are less than 1.7 gpm per sq ft, and the median Q/sL number is 0.6 gpm per sq ft. The screen

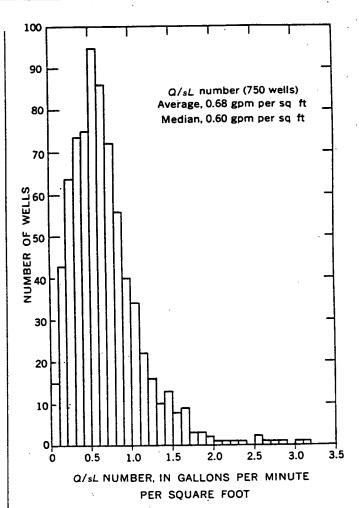


Figure 16.—Distribution of Q/sL numbers for wells screened in the Magothy aquifer. (Average hydraulic conductivity of screened intervals approximates 2,000 Q/sL; see text discussion.)

lengths in many of the Magothy wells are greater than 50 feet (fig. 17), and the average screen length is about 40 feet. Therefore, the effects of across-bed flow on the Q/sL numbers of most wells screened in this aquifer are probably less than in the upper glacial aquifer.

Lithologic descriptions of the screened intervals were available for all 750 Magothy wells with test data. More than half of these descriptions consisted of a single lithology, and many of the remaining screened intervals

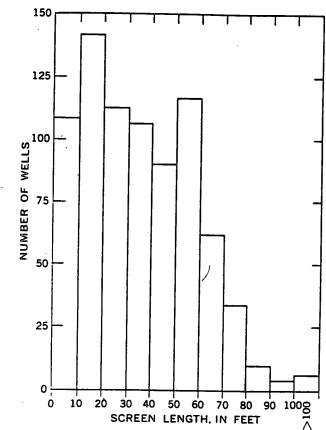


FIGURE 17.—Distribution of screen lengths of wells in the Magothy aquifer.

were described as predominantly one lithology. The median Q/sL numbers determined for each lithologic class from the descriptions of the screened intervals, the range in Q/sL numbers assigned to each lithologic class, and the corresponding range of calculated hydraulic conductivity values for each class are listed in table 9.

Lithologic logs describing the Magothy aquifer in 300 wells were analyzed to determine point values of average hydraulic conductivity. The distribution of these wells (fig. 18) was fairly uniform in Queens, Nassau, and western Suffolk Counties, but the number of wells for which logs were available is much less in central Suffolk County. In addition, the proportion of wells penetrating the entire Magothy aquifer becomes progressively smaller proceeding eastward in Suffolk County.

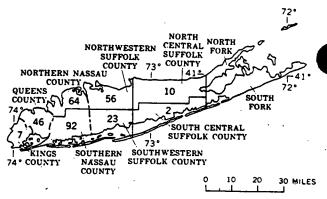


FIGURE 18.—Number of wells for which lithologic logs were available for the Magothy aquifer in the indicated subareas in 1967.

A map showing thickness of the saturated Magothy aquifer (pl. 2A) was prepared from an unpublished map of the September 1965 water table, from well logs, and from maps and data contained in several reports (Isbister, 1966; Lubke, 1964; Perlmutter and Geraghty, 1963; Pluhowski and Kantrowitz, 1964; Swarzenski, 1963; Julian Soren, written commun., 1968). Maps showing lines of equal average hydraulic conductivity (pl. 2B) and equal transmissivity (pl. 2C) were constructed according to the procedures outlined previously.

The Magothy aquifer thickens gradually toward the southeast and attains its maximum recorded thickness about 1,000 feet beneath the barrier beaches in south central and southeastern Suffolk County (pl. 2A). The aquifer thins markedly and locally is absent in buried valleys along the northern shore and in western Long Island.

The lines designating the highest values of estimated average hydraulic conductivity generally occur in the northern and northwestern parts of the island (pl. 2B) where the aquifer is thinnest and where a basal gravel deposit makes up most of the section. The smallest values of average hydraulic conductivity occur in the south-central and southeastern parts of the island, where the aquifer is thickest. The decrease in average hydraulic conductivity towards the southeast is related to an increase in the percentage of fine materials such as silt and clay in the aquifer in those areas.

Table 9.—Assigned range of Q/sL numbers and calculated hydraulic conductivity values for selected lithologic classes in the Magothy aquifer

	Lithologic class		Median Q/sL num-	Assigned range of	Calculated range	
No.	Description	Number of wells	ber of screened intervals (gpm per sq ft)	Q/sL numbers (gpm per sq ft)	of hydraulic conductivity (gpd per sq ft)	
1 2	Gravel, sand and gravel, and coarse sand	219 531	0. 7 . 5	0. 6-0. 8 0. 1-0. 5	1, 200–1, 60 200–1, 00	
	Clay, sandy clay, and silty clay			1 0		

¹ Assumed; see text discussion.

The transmissivity of the Magothy aquifer (pl. 2C) tends to increase towards the south and southeast. Altough the estimated average hydraulic conductivity tends to decrease in this direction, the greater percentage increase in aquifer thickness results in an increased transmissivity. The estimated maximum transmissivity of the Magothy aquifer is about 400,000 gpd per ft near the barrier beach in south-central Suffolk County.

Average thickness, hydraulic conductivity, and transmissivity of the Magothy aquifer in subareas of Long Island are derived from plate 2A, B, and C and are listed in table 10. The average hydraulic conductivity for each subarea is lowest in south-central Suffolk County (360 gpd per sq ft) and is highest in Kings County (over 600 gpd per sq ft). The average transmissivity by subarea is highest in south-central Suffolk County (320,000 gpd per ft), where the Magothy aquifer is thickest.

Table 10.—Average thickness, hydraulic conductivity, and transmissivity of the Magothy aquifer in subareas of Long Island

Subarea	Area (sq mi)	Average total thickness (feet)	Average hydraulic conductivity (gpd per sq ft)	Average transmissivity (gpd per ft)
Kings County	18	140	630	85,000
Queens County	61	170	460	80,000
Northern Nassau County	93	300	450	140,000
outhern Nassau County orthwestern Suffolk	154	600	420	250,000
CountySouthwestern Suffolk	150	430	420	180,000
County	115	770	410	320, 000
North central Suffolk County.	254	650	400	260, 000
South central Suffolk County.	141	900	360	320,000
Subarcas studied	998	580	410	240,000

LLOYD AQUIFER

Q/sL numbers of wells screened in the Lloyd aquifer range from less than 0.1 to 2.1 gpm per sq ft (fig. 19). This compilation includes virtually all the wells screened in the Lloyd aquifer for which test data are available. About four-fifths of the Q/sL numbers are between 0.1 and 0.6 gpm per sq ft and the median Q/sL number for all wells is 0.35 gpm per sq ft. Screens of wells in this aquifer range from less than 10 to 90 feet in length (fig. 20). About one-third of the screens are short (15 feet or less), which suggests that vertical flow components may have materially affected the discharge of some of these wells.

Lithologic descriptions of the screened interval were available for all 94 Lloyd wells with test data. Almost half the screened intervals were described as one lithology, and most of the remaining screened intervals were described as predominantly one lithology. The

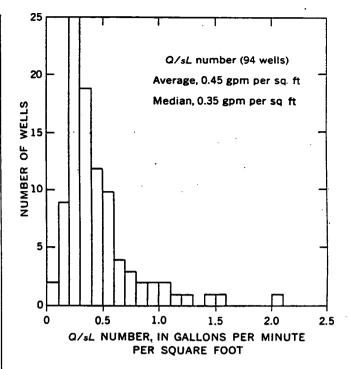


FIGURE 19.—Distribution of Q/sL numbers for wells screened in the Lloyd aquifer. (Average hydraulic conductivity of screened intervals approximates 2,000 Q/sL; see text discussion.)

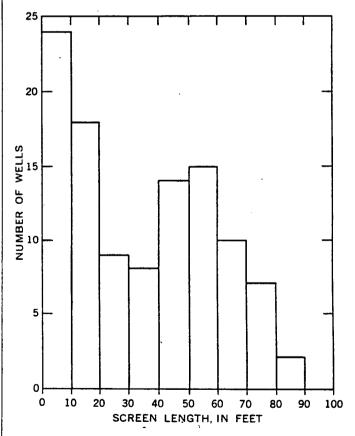


FIGURE 20.—Distribution of screen lengths of wells in the Lloyd aquifer.

Table 11.—Assigned range of Q/sL numbers and calculated hydraulic conductivity values for selected lithologic classes in the Lloyd aquifer

	Lithologic class	- Number	Median Q/sL num- ber of screened	Assigned range of O/sL numbers	Calculated range
No.	Description	of wells	(gpm per sq ft)	intervals (gpm per sq ft)	conductivity (gpd per sq ft)
1	Gravel, sand and gravel, and coarse sand	48 46	0. 35 . 30	0. 3-0. 4 0. 05-0. 2	600-800 100-400
3	layers. Clay, sandy clay, and silty clay			1 0	O

I Assumed: see text discussion.

median Q/sL numbers determined for each lithologic class, the range in Q/sL numbers assigned to each class, and the corresponding range of calculated hydraulic conductivity values for each class are listed in table 11.

Lithologic logs in 132 wells tapping the Lloyd aquifer were analyzed to obtain point values of average hydraulic conductivity, and most of these wells almost completely penetrated the aquifer (fig. 21). Logs from only 10 Lloyd wells are available for all of Suffolk County, and most of these are in the northwestern part of the county. Furthremore the Llyod wells in Nassau County are concentrated near the shorelines.

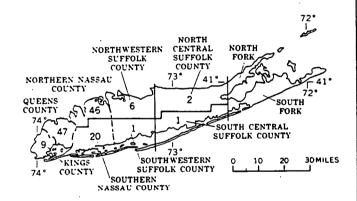


FIGURE 21.—Number of wells for which lithologic logs were available for the Lloyd aquifer in the indicated subareas in 1967.

A thickness map of the Lloyd aquifer (pl. 3A) was prepared from well logs and maps and data contained in several reports (Isbister, 1966; Lubke, 1964; Perlmutter and Geraghty, 1963; Pluhowski and Kantrowitz, 1964; Swarzenski, 1963; and Julian Soren, written commun., 1968). Maps showing lines of equal average hydraulic conductivity (pl. 3B) and equal transmissivity (pl. 3C) were constructed according to the procedures outlined previously.

The Lloyd aquifer thickens gradually to the south and southeast (pl. 3A). The maximum recorded thickness of about 450 feet occurs beneath the barrier beaches in southern Nassau County. The irregular pattern of the northern boundary of the aquifer in Queens and

Nassau Counties indicates erosion of the aquifer before deposition of the overlying glacial materials.

The lines of estimated equal average hydraulic conductivity indicate that the material in the Lloyd aquifer (pl. 3B) is less permeable toward the southeast; however, the position of these lines is based on very little well data.

The lines of equal transmissivity (pl. 3C) exhibit the same gross pattern as the lines on the map showing thickness and exhibit increasing values toward the south. This similarity in pattern reflects the fact that the percentage increase in the thickness of the aquifer (pl. 3A) is greater than the percentage decrease in estimated average hydraulic conductivity (pl. 3B). The maximum estimated transmissivity, 140,000 gpd per ft, occurs where the aquifer is thickest in southern Nassau County.

Average thickness, hydraulic conductivity, and transmissivity of the Lloyd aquifer in subareas of Long Island are derived from plate 3A, B, and C and are listed in table 12. As noted previously, many of the values in table 12 are based on very few well data.

Table 12.—Average thickness, hydraulic conductivity, and transmissivity of the Lloyd aquifer in subareas of Long Island

Bubarea	Area (sq mi)	Average total thickness (feet)	Average hydraulic conductivity (gpd per sq ft)	Average transmissivity (gpd per ft)
Kings County	39	80	420	85, 000
Queens County	81	140	430	60,000
Northern Nassau County	106	200	440	90,000
Southern Nassau County Northwestern Suffolk	154	300	400	120,000
County	160	220	410	90,000
County	115	320	280	90,000
North central Suffolk County South central Suffolk	254	240	320	75, 000
County	141	300	270	80,000
Subareas studied	1,050	240	360	90, 000

COMPARISON OF THE PRINCIPAL AQUIFERS

The curves representing the distribution of Q/sL numbers of the four principal aquifers (fig. 22) are of roughly comparable slope, but vary in position with respect to the ordinate, owing to the different ranges and distributions of Q/sL numbers in the different

aquifers. Because the Q/sL number is related to the odraulic conductivity of the deposits near the well een, the curves in figure 22 provide a visual comparison of the distribution of average hydraulic conductivities of what are, in general, the more permeable zones in the respective aquifers.

CONCLUSIONS

The principal results of this investigation are a series of island-wide maps of estimated average hydraulic conductivity and transmissivity for each of the aquifers on Long Island (figs. 14 and 15, and pls. 1B, C, 2B, C, and 3B, C). Average values, derived from these maps for the mainland of Long Island, of thickness, hydraulic conductivity, and transmissivity for the aquifers are listed in table 13. The Magothy aquifer has the highest average transmissivity (240,000 gpd per ft) and the greatest average thickness (580 feet) of any of Long Island's aquifers, although the upper glacial aquifer has the greatest average hydraulic conductivity (1,700 gpd per sq ft). The Lloyd aquifer has the lowest aver-

age hydraulic conductivity (360 gpd per sq ft) and lowest average transmissivity (90,000 gpd per ft) of the four principal aquifers. The possible errors in these values locally may be on the order of plus or minus 50 percent, and in certain areas, such as the deep buried valleys near the north shore of Long Island, the possible error in the estimates may be greater than 50 percent. Despite these possible errors, the mapped values are believed to represent a reasonable initial definition of the average hydraulic conductivity and transmissivity of Long Island's aquifers.

TABLE 13.—Average thickness, hydraulic conductivity, and transmissivity of the principal aquifers of Long Island

[Values were determined for the mainland of Long Island excluding the forks]

Aquifer	Average thickness (feet)	Average hydraulic conductivity (gpd per sq ft)	Average transmissivity (gpd per ft)	
Upper glacial Jameco Magothy Lloyd	120	1, 700	200, 000	
	80	1, 300	100, 000	
	580	420	240, 000	
	240	360	90, 000	

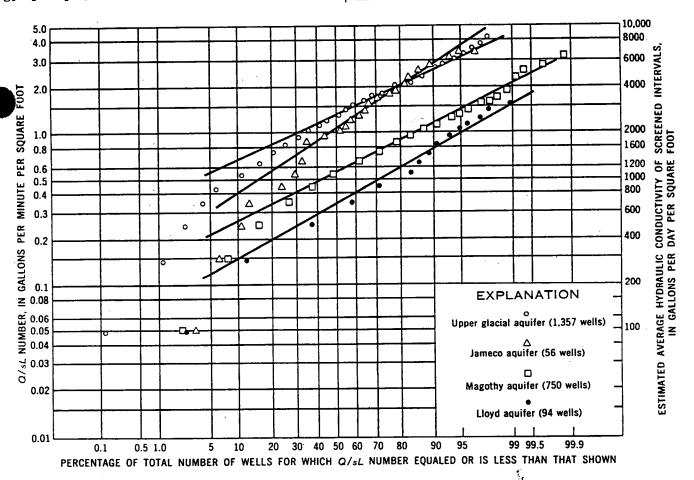


Figure 22.—Relation between Q/sL numbers and percentage of total number of wells for the four principal aquifers. (Average hydraulic conductivity of screened intervals approximates 2,000 Q/sL; see text discussion.)

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REFERENCE NO. 7

Analog-Model Analysis of Regional Three-Dimensional Flow in the Ground-Water Reservoir of Long Island, New York

By RUFUS T. GETZEN

GEOLOGICAL SURVEY PROFESSIONAL PAPER 982

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A_1			K_B	minimum principal hydraulic conductivity (length/			
A_2		nilarity coefficients for relating hydrologic quan-		time) metres (length)			
A_3	τ	ities to their electronic counterparts	m m ³ /s	cubic metres per second—volumetric discharge			
A ₄)	am	peres		(length ³ /time)			
C		pacitance (coulombs/volt)	mA	milliamperes (10 ⁻³ ×coulombs/sec)			
cm	-	atimetres (length)	Mgal/d	million gallons per day (length³/time)			
cm ⁻¹		riprocal centimetres (1/length)	(Mgal/d)/mi ²	million gallons per day per square mile-volumetric			
cm/s	COT	timetres per secondDarcy velocity (length/time)	1	recharge rate (length/time)			

A_{i}	•	K_B	minimum principal hydraulic conductivity (length/
A_2	similarity coefficients for relating hydrologic quan-		time)
A_3	tities to their electronic counterparts	m	metres (length)
A_4		m³/s	cubic metres per second-volumetric discharge
amp	amperes		(length³/time)
C	capacitance (coulombs/volt)	mA	milliamperes (10 ⁻³ ×coulombs/sec)
cm	centimetres (length)	Mgal/d	million gallons per day (length³/time)
cm ⁻¹	reciprocal centimetres (1/length)	(Mgal/d)/mi ²	million gallons per day per square mile-volumetric
cm/s	centimetres per second—Darcy velocity (length/time)		recharge rate (length/time)
cm/d	centimetres per day (length/time)	pf	picofarads (10 ⁻¹² ×coulombs/volt)
coul	coulombs	Q	volumetric discharge rate (length³/time)
E	electromotive potential (volts)	q	electric charge (coulombs)
ft	feet (length)	(q_x)	
ft/d	feet per day (length/time)	$\left q_{y} \right $	components of Darcy velocity (length/time)
ft³/s	cubic feet per second (length³/time)	(q_z)	
(gal/d)/ft²	gallons per day per square foot (=1 Meinzer Unit; unit	R	resistance (ohms)
	gradient and prevailing ground-water temperature	S_s	specific storage; storage per unit volume (1/length)
	presumed)	S_{y}	specific yield (dimensionless)
h	head, ground-water potential (length)	s	second (time)
I	electric current (coulombs/time)	T	transmissivity (length ² /time)
K	hydraulic conductivity (length/time)	t	time
K_x	hydraulic conductivity in x, y, z directions, respec-	t'	model time (as opposed to real time)
K_{y}	tively; gradient and discharge are assumed to be	V	volume (length³)
K_{z}	measured in same direction (length/time)	x)	
K _{zr}	hydraulic conductivity in various directions; first	y }	dimensions in arbitrary directions (length)
K_{xy}	subscript denotes direction of discharge, second	z)	
K_{xz}^{∞}	subscript direction of gradient. K is a symmetric	x')	
K_{vv}	tensor, so no change in quantity results from re-	y' }	dimensions corresponding to principal conductivities
K_{s}	versing subscript (length/time)	z'	
K_{yy} K_{zz} K_{zz}		۷ د	finite-difference operator, $\Delta x = x_1 - x_0$
KA	maximum principal hydraulic conductivity (length/	1	• •
	time)	1	•

CONTENTS

CONVERSION TABLE

[The following conversions are given to four significant digits. Equivalent metric and English units in the text, however, have the same relative accuracy]

metric centimetres (cm) centimetres (cm) centimetres per second (cm/s) centimetres per second (cm/s) centimetres per second (cm/s) centimetres per year (cm/yr)	Multiply by 3.937×10 ⁻¹ 3.281×10 ⁻² 2.835×10 ³ 2.223×10 ⁴ 1.868×10 ⁻²	English inches (in.) feet (ft) feet per day (ft/d) gallons per day per square feet [(gal/d)/ft²] million gallons per day per square mile [(Mgal/d)/mi²]	cubic metres per second (m³/s) cubic metres per second (m³/s) kilometres (km) metres (m) square kilometres (km²) square metres (m²) metres per kilometre	Multiply by 3.531×10 2.282×10 6.214×10 ⁻¹ 3.281 3.861×10 ⁻¹ 1.076×10 5.280	English cubic feet per second (ft³/s) million gallons per day (Mgal/d) miles (mi) feet (ft) square miles (mi²) square feet (ft²) feet per mile (ft/mi)
		[(Mgal/d)/mi ²]	metres per kilometre (m/km)	5.280	feet per mile (ft/mi)

ANALOG-MODEL ANALYSIS OF REGIONAL THREE-DIMENSIONAL FLOW IN THE GROUND-WATER RESERVOIR OF LONG ISLAND, NEW YORK

By Rufus T. Getzen

ABSTRACT

A three-dimensional analog model of the ground-water system beneath Long Island, N.Y., provides a practical means for studying anisotropic flow on a regional scale. Constructional and operational techniques influence the simulation almost as much as model design does. Usefulness and accuracy of the model depend on (1) inherent and practical limitations of the finite-difference method, (2) accuracy and completeness of the data base, and (3) accuracy of the assumptions and approximations that were made in applying the simulation technique to this particular ground-water reservoir.

Reliable data used in design of the model are (1) horizontal hydraulic conductivity and thickness of three major aquifers, (2) extent of confining beds, (3) specific yield, and (4) locations of streams. Estimates of vertical hydraulic conductivity and specific storage were applied to the model. Most spatially fixed model boundaries are good representations of prototype (real-world) boundaries. Most dynamic boundaries are only approximately represented, and some dynamic boundaries require application of unproved assumptions. The simulated ground-water reservoir generally agrees with prototype hydrology, and the model is being used for predictive studies.

INTRODUCTION

BACKGROUND

More than one-third of the 7.3 million people on Long Island are wholly dependent on ground water as a source of water, and the remaining two-thirds use some ground water. More significantly, Nassau and Suffolk Counties, which together constitute more than 85 percent of the land area of Long Island, depend entirely upon ground water for all their water needs. The populations of Nassau and Suffolk Counties are growing rapidly, and the governing bodies of these counties are already planning for a time in the foreseeable future when the consumptive-use rate will reach the rate of total recharge to the ground-water reservoir.

Use of ground-water resources presents several problems that differ from those encountered in use of surface-water supplies. Most of these problems arise from or can be reduced to three basic conditions: (1) The properties of ground-water reservoirs, or aquifers. are fundamentally geologic and their investigation proceeds with great expense, great difficulty, and much guesswork: (2) ground-water reservoirs are intercon-,

activities and natural events can influence water quantity and quality over wide areas; (3) ground water moves at such slow rates that movement from the point of recharge to the point where the water is ultimately discharged typically requires decades or centuries, and direct observation of this movement is usually impossible.

One of the most powerful tools available to the ground-water hydrologist for predicting the behavior of large, complex aquifer systems such as the one on Long Island is a model—a mathematical or physicalmathematical technique for simulating the physics of ground-water flow. Such models require much simplification of the geometry and properties of the aquifers. The most frequent simplification is that the aquifer material is isotropic; that is, its hydraulic conductivit is the same in all directions at any given point. This simplification is seldom even approximately correct (Hubbert, 1940, p. 826), but because of flow geometry, it is commonly assumed to have little adverse effect on the accuracy of flow predictions.

The present study, investigating ground-water flow on Long Island, indicates that the anisotropy of the aquifers is a major factor controlling the effects of ground-water development and that these effects must be considered in managing Long Island's water resources. One of the principal goals of this report is to provide a physically sound practical basis for analyzing anisotropic flow on a regional scale.

PURPOSE AND SCOPE

This report discusses design, construction, and operation of a three-dimensional electrical analog model of the ground-water system beneath Long Island, N.Y. Because the streams of Long Island are important as boundaries within the aquifer system, some aspects of stream hydrology are also represented by this model, but the design of the model limits its major uses to predicting regional or general changes in ground water head or flow. This report describes sources ar nected over large areas, and seemingly isolated human | types of data used in designing the model, some of the

basic concepts and assumptions that underlie its operation. calibration of the model in terms of historical hydrologic data. probable sources of inaccuracy in its results. and certain conclusions on the behavior of anisotropic aquifers.

A prime use of the model will be to anticipate the response of the flow system to various expected and proposed stresses. These stresses can take the form of pumping or recharge through wells, streams, or basins. A model of this type cannot be used for water-quality predictions, although crude estimates and general trends in water quality can be derived from hydrologic information gained from the model. Several of the proposed water-management schemes have been modeled: results of some of this modeling are the subject of additional reports in this series of publications.

PREVIOUS WORK

Previous research, on which this study is dependent, is of two types: (a) Development of theory and techniques for analysis of ground-water flow; and (b) studies of Long Island's water resources, which have provided (1) information on the geologic background, (2) hydrologic data, and (3) general understanding of the hydrologic situation on Long Island.

The geology of Long Island has been studied extensively since the mid-nineteenth century, and a massive literature has accumulated. Some of the more important early papers are those by Mather (1843), Upham (1879), Dana (1890), Hollick (1893, 1894), Woodworth (1901), and Salisbury (1902). DeVarona (1896) and Freeman (1900) studied the water resources of the western part of Long Island. The report by Veatch, Slichter, Bowman, Crosby, and Horton (1906) is a comprehensive study of the geology and the water resources of the entire island but does not include quantitative data on the hydrologic properties of the ground-water reservoir.

Few quantitative data on aquifer properties were available before 1950, but some controlled pumping tests were made by C. E. Jacob, J. G. Ferris, W. V. Swarzenski, M. A. Warren, and N. J. Lusczynski at various times between 1935 and 1950 (Jacob, 1939, 1941, 1945; McClymonds and Franke, 1972) and yielded data of varying quality and quantity. McClymonds and Franke (1972), working with lithologic logs and acceptance tests from about 1.300 wells, compiled estimates of the transmissivity and the bedparallel hydraulic conductivity for the major aquifers of Long Island. These estimates have been used in the current study.

Geologic and hydrogeologic features of Long Island have been described in comprehensive reports by other

authors since the 1906 report by Veatch, Slichter, Bowman, Crosby, and Horton (Fuller, 1914; Suter and others, 1949). Detailed geology of smaller areas is described in reports by Isbister (1966), Lubke (1964), Perlmutter and Geraghty (1963), Pluhowski and Kantrowitz (1964), Swarzenski (1963), Soren (1971), and Jensen and Soren (1974).

The present investigation is not the first U.S. Geological Survey study of Long Island's water resources to use analog modeling techniques, but with some exceptions, the previous studies were not published, largely because of inadequacies or inaccuracies in the models. In October 1964, plans were begun for constructing an analog model of Long Island's aquifers. These plans resulted in the construction of a two-layer regional flow model of the western half of Long Island. Attempts to verify this model against historical and synthetic data produced inconsistent results. Experimentation over a period of 2 years with this model failed to bring it into tolerable agreement with all known aspects of Long Island's hydrology. This model indicated that a two-layered concept was inadequate for describing the ground-water flow system beneath Long Island. Part of the difficulty in obtaining an adequate representation of the hydrologic system was insufficient data on the confining beds that overlie parts of the Magothy aquifer.

In 1966, a steady-state axisymmetric analog of flow to a single well was used in the interpretation of pumping tests at Bay Park, Long Island. Experimentation with cross-sectional models of the aquifer system was begun in 1968. Results from a model of this type were used by Franke and Cohen (1972) to compute regional rates of ground-water movement. Additional crosssectional modeling was done by Franke and Getzen (1975). A series of modeling experiments, in which the vertical and the horizontal conductivities of aquifers and confining beds, rates of recharge, and other hydrologic parameters were varied systematically, demonstrated the importance of anisotropy in controlling regional ground-water flow on Long Island. Some of the results of this series of experiments serve as basic starting points for the design of the three-dimensional model discussed in this report.

In 1971, work was begun on the model that is the subject of the present report. Construction of the model was completed in less than 4 months, but testing and modification of the model were not completed until early 1974. This analog model represents three-dimensional regional flow in the ground-water reservior on Long Island. The digital modeling techniques that were available at the time this model was begun could not supply the needed accuracy and resolution when used on computers of the size commonly avail-

able. Existing analog techniques could be easily adapted to simulate three-dimensional, anisotropic flow; because development of an adequate digital model would require much experimentation, the author chose the analog approach.

Two Long Island modeling studies that were not done by the Geological Survey were (a) a cross-sectional Hele-Shaw model (Wilson, 1970) and (b) a single-aquifer digital model of the southeastern part of Long Island (Fetter, 1971). The Hele-Shaw model is sophisticated in concept and design and uses composite anisotropic permeabilities (Collins and others, 1972; Collins and Gelhar, 1970).

LOCATION AND GENERAL PHYSIOGRAPHY OF STUDY AREA

Long Island is bounded on the north by Long Island Sound, on the east and south by the Atlantic Ocean, and on the west by New York Bay and the East River (fig. 1). The island parallels the New York and Connecticut coasts for about 190 kilometres (120 miles) and has an area of about 3,600 square kilometres (1,400 square miles), including several smaller islands that are within the same political boundaries. The eastern end of Long Island is divided into two narrow forks by the Peconic Bay, and the southern edge of the island is fringed with an almost continuous line of barrier beaches. The forks and barrier beaches are not included in the primary study area shown in figure 1.

Data from the barrier beaches were used in designing and testing the model, but no predictive capability was developed for these areas. The area of the two forks (east of Shinnecock Canal and Mattituck Creek) was not used.

3

The island is divided into four counties, two of which (Kings and Queens Counties) are within the political boundaries of New York City. Kings, Queens, Nassau, and Suffolk Counties have areas of 202, 298, 754, and 2.390 square kilometres (78, 115, 291, and 923 square miles), respectively.

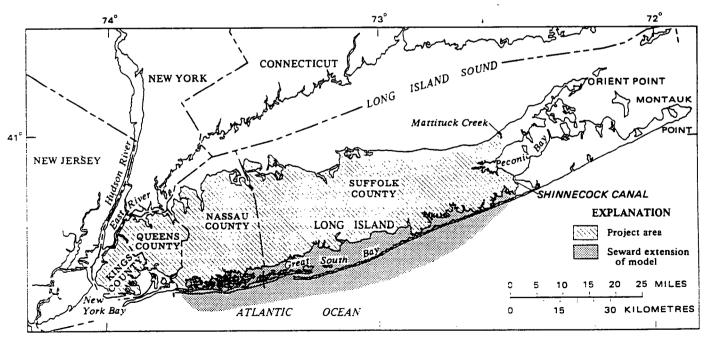
ACKNOWLEDGMENTS

Parts of this report were included in the author's Ph.D dissertation, Department of Geology, University of Illinois. Publication rights have been given to the Geological Survey.

Prof. O. L. Franke of City College, New York City University, assisted the author in gathering the data for this report. Prof. Franke also examined the report for technical accuracy.

Mr. D. E. Vaupel provided unpublished stream data. He and several of his assistants provided qualitative and quantitative information about Long Island streams, both orally and written, on several occasions during 1971–73.

Laboratory assistants B. H. Cohen, M. E. Eskenazi, Daniel Gillen, Natale Guadagnino, and R. F. Lingner built the model; they and A. W. Harbaugh and Donald



Base from U.S. Geological Survey, 1:250,000 series: Scranton, Hartford, 1962; New York, 1957; Newark, Providence, 1947

FIGURE 1.-Long Island, N.Y., showing area of investigation.

Hockheiser assisted in testing and modifying the model

UNITS OF MEASURE

Metric units were used in this study, but not for field data and not until after most of the model design and construction were completed. Metric units have been given preference in the text, but some illustrations, adapted from other sources, could not be easily modified and are reproduced here in their original units. Where these illustrations are referred to in the text, the original units in the illustrations are mentioned first. This inconsistency seems unavoidable.

HYDROGEOLOGY OF LONG ISLAND

The hydrologic cycle on Long Island, as in most places, tends towards a state of dynamic equilibrium. That is, the naturally occurring outputs of water tend to balance the inputs, and the pattern of flow remains fairly constant over long periods of time. The sun provides the energy to maintain the hydrologic cycle by evaporating water at low altitudes and releasing it at higher altitudes in the form of precipitation. Precipitation is indicated by (A) in figure 2, which outlines the major components of the hydrologic cycle; evaporation is shown by (B). Rates of evaporation are greatest where bodies of surface water are directly exposed to sun and wind, but some evaporation occurs across the entire surface of the island.

Some of the precipitation occurs over bodies of surface water or within such a short distance from them that the water reaches these surface-water bodies without infiltrating the soil. Such direct runoff accounts for a small percentage of the total precipitation on Long Island, and, except in areas with storm sewers, is an infrequent event.

Water is also transpired to the atmosphere by plants (C). On Long Island, the sum of the quantities of transpiration and evaporation is almost always less than precipitation. Net natural recharge to the ground-

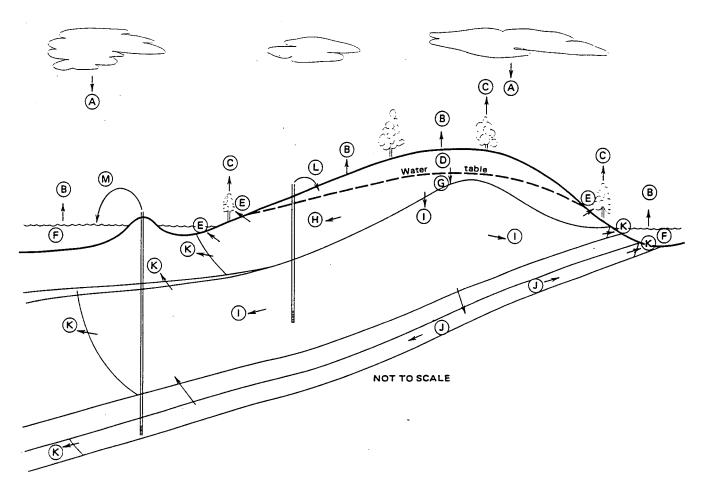


FIGURE 2.—Major components of the hydrologic cycle on Long Island: (A) precipitation. (B) evaporation, (C) transpiration, (D) unsaturated ground-water flow, (E) surface seepage, (F) salty water, (G) saturated ground-water flow, (H) glacial aquifer, (I) Magothy aquifer, (J) Lloyd aquifer, (K) dispersion into salty ground water, (L) deep pumpage returned to surface, and (M) deep pumpage returned to salty water. Arrows show inferred direction of water movement.

water reservoir is the difference between precipitation and the sum of evaporation and direct runoff. The ground-water reservoir is that part of Long Island's rocks and sediments that is saturated with freshwater (G), but recharge does not usually enter this saturated zone without first passing through an unsaturated zone (D) in which the interstices (openings between sedimentary particles) are only partly filled with liquid water. Part of the interstitial volume is occupied by water vapor and other gases. The ground-water reservoir is separated from the unsaturated zone by the water table-a surface along which the interstitial pressure is equal to atmospheric pressure. The top part of the reservoir (H), the glacial aquifer, is a water-table aquifer; its upper surface is the water table. Some of the water in the water-table aquifer is discharged directly to the surface as springs and as seepage to streams, lakes, and marshes. Collectively, these discharge points (E) are known as seeps. The remainder of the water in the water-table aquifer flows into other hydrogeologic units (I and J). The Magothy aquifer (I) and the Lloyd aquifer (J) are distinguished from the glacial aquifer (H) by differences in lithology and geologic origins, by differences in physical properties, or by the fact that water flows within each aquifer more readily than from one aquifer to another.

Water from all three aguifers (H, I, and J) is eventually discharged to salty surface water, either directly or through intervening sediments containing mixed freshwater and salty water (K). This discharge and most other components of the hydrologic cycle are inputs and outputs in relation to the ground-water reservoir. These inputs and outputs form the natural stresses and boundary conditions to the reservoir.

Flow within the ground-water reservoir is controlled by three factors-driving forces, resistive forces, and changes in storage. A flow system in dynamic equilibrium maintains a constant flow rate and a flow pattern that does not change with time; hence, there are no changes in storage. Although the Long Island flow system tends towards dynamic equilibrium, such equilibrium is not perfectly achieved. There are small, local changes in flow patterns (and in storage) resulting from waves and tides and daily fluctuations in precipitation. There are larger changes in flow resulting from climatic changes and human activities; these are discussed later in this section. Driving forces within the reservoir result from differences in the potential energy at different points within the reservoir. Two sources of potential energy are pressure and direct ac- voir is through seepage to streams and marshes. The tion of gravity. The sum of the gravitational potential | remainder of the natural discharge is to salty surface and pressure potential at any point is the ground- | water, either directly or through mixing with the salty water head at that point, and the driving force equals | ground water that surrounds Long Island. Th the gradient of head. Both the direction and the mag- | mechanism through which this mixing occurs is poorly

nitude of the driving force differ from point to point within the reservoir. On a macroscopic scale (a scale that includes a statistically significant number of interstices), the spatial variation in head can be described by piecewise continuous functions.

Resistive forces result from friction between the moving fluid and the surfaces of the sedimentary particles. The forces are described by the term hydraulic conductivity, which includes such factors as density and viscosity of the water and microscopic geometry of the sedimentary fabric. Not only does the geometry of the sedimentary fabric differ from point to point in the reservoir, but the fabric usually has a directional aspect, so that the hydraulic conductivity perpendicular to bedding at any point is less than the conductivity parallel to bedding. The first characteristic is described as nonhomogeneity, the second as anisotropy; both characteristics are true of the sediments that compose the Long Island ground-water reservoir.

The glacial aquifer (H in fig. 2) shows the least nonhomogeneity and the least anisotropy of any Long Island aquifer. At the other extreme, the hydraulic conductivity in the direction of bedding in the Magothy aquifer ranges through an order of magnitude or more along any bedding plane and through several orders of magnitude from top to bottom. The conductivity of the latter aguifer is also significantly lower perpendicular, to bedding than it is along the bedding. Very little is known about the hydraulic conductivity of the Lloyd aquifer (J), but very little water flows through this aguifer (Franke and Getzen, 1975).

Properties of the water throughout a reservoir are usually assumed to be constant, and differences in hydraulic conductivity are assumed to be the result of differences in the medium (the sediments); but these assumptions cannot always be made. Salty water has a density different from that of freshwater; hot water is less dense and less viscous than cool water, and water flowing through sanitary landfills may have a viscosity and density quite different from those of the native ground water.

Flux (flow per unit area) through any part of the reservoir is equal to the product of the hydraulic gradient and the hydraulic conductivity. For isotropic aquifers, direction of flow is directly downgradient; but for anisotropic aquifers, such as those that constitute the Long Island ground-water reservoir, direction of flow may diverge from the direction of the gradient.

More than half the natural discharge from the reser-

understood; theoretical models, such as Cooper (1959) and the Gheyben-Herzberg theory (Glover, 1959), do not seem to fit the Long Island situation (Upson, 1966). Beneath the barrier islands along Long Island's south shore, fresh ground water is found at depths where it should be salty according to both equilibrium models. Two explanations for this have been proposed—(1) that the salty ground water is not in equilibrium with present-day heads along Long Island's south shore and that the fresh ground water there is a relic of the island's last glaciation; or (2) that the salty water is in equilibrium with the heads but that the conditions for equilibrium are modified by the osmotic effects of clay within the lower part of the reservoir. Neither of these explanations can be wholly proved or disproved. Other possible explanations are that presently observed heads reflect human influences or that Long Island's climate is significantly drier than it was a few centuries ago. However, observed heads in the water-table aquifer indicate little or no change during the past 70 years throughout most of the eastern half of Long Island, and there is very little evidence to support the hypothesis of much greater precipitation at any time since the last major glaciation.

Human influences on the hydrologic cycle are of three types: (1) Reduction of recharge through paving and storm sewers, (2) removal of water from deeper aquifers through wells and recharge to the water-table aquifer through cesspools and basins, and (3) removal of ground water through wells and discharge to the ocean through sewers. These last two are shown as new components to the hydrologic cycle (L and M, fig. 2). All three human influences result in immediate changes in the amount of ground water in storage, followed by spreading changes in head and flow patterns as the system seeks a new equilibrium. All three human influences were active in Kings and western Queens Counties from the mid-nineteenth century until the early 1940's. The flow system responded to this stress by (1) reduced heads, (2) reduced streamflow, and (3) intrusion of salty water into the more highly conductive parts of the reservoir. Human influences of all three types have been active in Queens and Nassau Counties since the 1940's, and the system has responded by (1) reduced heads and (2) reduced streamflow. Seepage to the bottoms of the surrounding saltwater bodies has been reduced somewhat, but to date (1975) little saltwater intrusion has been observed. Human influences in Suffolk County have generally been limited to removal of water from deep aquifers and recharge to the water-table aquifer. The only observed response has been a decline of head at depth in the western one-third of Suffolk County.

Human activities have also affected quality of ground water on Long Island. Cesspool effluent, industrial wastes, road salt, contaminated runoff from highways and parking lots, decomposing wastes in sanitary landfills, chemical fertilizers and pesticides. animal feces, and leaking sewer mains have all degraded the quality of recharge water. Large parts of the ground-water reservoir now contain water of less than desirable quality. The glacial aquifer is affected over most of the western half of the island and the Magothy aguifer in the west-central part of the island where the movement of ground water is predominantly in a downward or down-and-lateral direction. Pumping from the lower part of the Magothy aguifer is accelerating the downward movement of the contaminated recharge water. This study, although it analyzes movement of ground water, does not attempt to explain or predict changes in water chemistry.

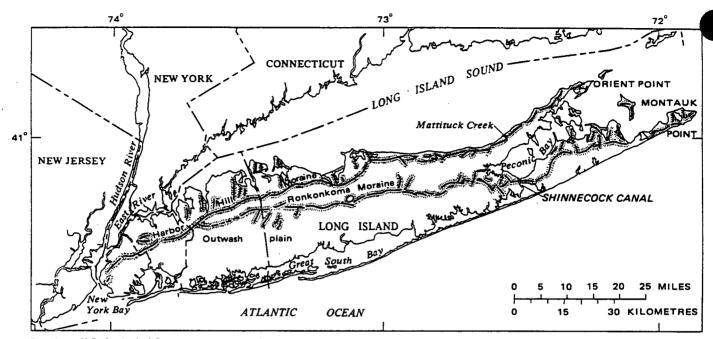
PROMINENT PHYSIOGRAPHIC FEATURES AND THEIR ROLE IN THE HYDROLOGY OF LONG ISLAND

The physiographic features of Long Island are a result of its geologic history; there is a conspicuous geographic relationship between many of these features and the hydrologic features of Long Island, not only because of their role in determining the gross geometry of the flow system but also because of the close connection between the topographic features and the underlying geology. The most prominent physiographic features are related to Pleistocene glaciation. These are (1) the east-west trending hills in the northern and central parts of the island and their eastward extensions, which form the north and south forks, (2) the gently sloping plain that extends southward from the hills, and (3) the deeply eroded headlands along the north shore. Other important features are the barrier beaches along the south shore, the shoreline, and the major streams.

The Harbor Hill Moraine, which forms the northern line of east-west trending hills, extends from Kings County to Orient Point on the north fork (fig. 3). The southern line of hills, which make up the Ronkonkoma Moraine, extends from northwestern Nassau County eastward to Montauk Point. These moraines were deposited near the southern terminus of glacial ice sheets and have an altitude ranging from 70 to 90 m (210 to 270 ft) in most places.

GEOLOGIC FEATURES

The consolidated bedrock that underlies Long Island in overlain by a wedge-shaped body of unconsolidated sediments (fig. 4). The bedrock is at or near land sur-



Base from U.S. Geological Survey, 1:250,000 series: Scranton, Hartford, 1962; New York, 1957; Newark, Providence, 1947

FIGURE 3.—Physiographic features that influence Long Island hydrology.

face in the northwestern part of Long Island and has a regional southeastward slope of about 0.7 degrees (about 12 m/km or 63 ft/mi). The bedrock has an extremely low hydraulic conductivity (not measured); the contact between it and the Cretaceous sediments can be considered to be the lower boundary of the groundwater flow system. The Cretaceous sediments and overlying deposits that are saturated with fresh, moving ground water constitute the ground-water reservoir.

Pertinent information on the reservoir rocks is summarized in table 1. Figures 4–8 show what was known of the gross geometry of the reservoir rocks at the time the three-dimensional model was constructed (1971). These illustrations are regional, hydrogeological interpretations used in the current study. Additional geologic data were acquired after the study began; improper model performance suggested some discrepancies in the geologic data before the new data were acquired. Other recently acquired geologic data are insignificant to the regional hydrology but would have to be considered in hydrologic analyses of small areas.

The lowermost aquifer, the Lloyd, directly overlies the bedrock. The Lloyd consists mainly of gravelly sand with lenses of silty sand and clay. Seepage into the Lloyd aquifer is limited by the overlying Raritan clay, which has a fairly uniform thickness of 60-90 m (200-300 ft) and probably has a very low hydraulic conductivity (Franke and Getzen, 1975). The Raritan

clay, even though silty and sandy in places, appears dense and well-compacted almost everywhere it has been seen, but it has been seen at only a few widely scattered localities. The Raritan is penetrated by only a few wells and is exposed in only a few places on the north shore of western Long Island. The clay is missing from the sequence in small areas of northwestern Long Island.

The Magothy aguifer, which probably includes parts of several poorly defined Cretaceous formations (Perlmutter and Todd, 1965), consists of a series of beds of fine to medium sand interbedded with clay and sandy or silty clay. Several of these beds seem to be fairly extensive, but none, apparently, can be traced for more than a few kilometres. The degree of consolidation of the sand beds varies from loose to moderately indurated, and their texture varies from silty to gravelly. Only rarely does the thickness of a single sand bed exceed 15 m (47 ft), but the thickness of some sandy zones that have only a few thin clay beds scattered through them are 50 m (160 ft) or more. Thickness of the clay beds range from a few millimetres to 20 m (66 ft); in many places, the beds are thicker in the upper part of the sequence than in the lower part.

The Magothy aquifer is overlain by several Cretaceous and post-Cretaceous units of low to very low hydraulic conductivity. Among these units are silty sandy clay beds of the Monmouth Group along the south shore of Long Island. The beds thicken seaward.

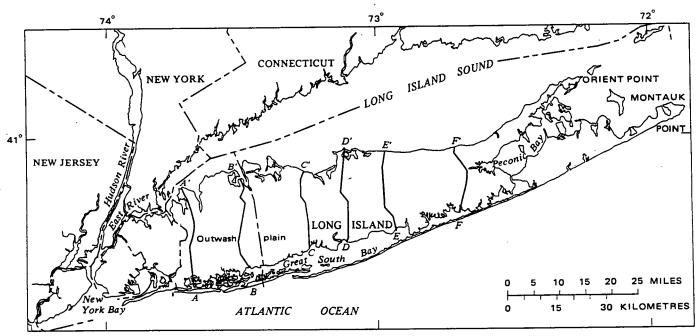
Clays of the Monmouth Group are not found on western Long Island. There, the Magothy aquifer is overlain by the Jameco Gravel, evidently a fluvio-glacial deposit on an erosional surface in the Magothy. A fringe of Pleistocene clay that surrounds the island extends a few kilometres inland along much of the south shore and in several places on the north shore. This fringing clay is almost always referred to as the Gardiners Clay but may include material of diverse geologic origins (Upson, 1970). Material identified in well logs as Gardiners Clay generally ranges in thickness from 2 to 120 m (6 to 400 ft). The areas of the thickest parts of the clay are very small. The clay in the subsurface near the south shore seems to thicken slightly in a seaward direction, but its seaward extent is largely unknown.

The upper glacial aquifer consists primarily of sand and gravel, which is glaciofluvial and glaciodeltaic in origin. Even the end-morainal features on much of Long Island seem to be associated with deformed deposits of stratified drift rather than till (Mills and Wells, 1974). Several tills within and above the stratified drift have been identified in the northern part of the island, and several extensive clays, evidently glaciolacustrine in origin, are found within the stratified drift.

DISTRIBUTION OF HYDRAULIC CONDUCTIVITY AND STORAGE COEFFICIENT

Regional trends in the hydraulic conductivity of the upper glacial and Magothy aquifers on Long Island have been mapped by McClymonds and Franke (1972). These trends, shown in figures 9 and 10, are sufficiently accurate for a regional ground-water model, although the ground-water reservoir is not completely defined by them. The Jameco aquifer, which is highly conductive, is important in western Long Island. Figure 11 shows the areal extent and estimated hydraulic conductivity of the Jameco aquifer. Although the Jameco aquifer is a distinct geologic unit (Soren, 1971), it is continuous with the Magothy aquifer over much of its area and has been considered in this study as a high-permeability zone at the top of the Magothy aquifer. Several additional but minor hydrogeologic units are also part of the Long Island ground-water reservoir and are lumped here with major units.

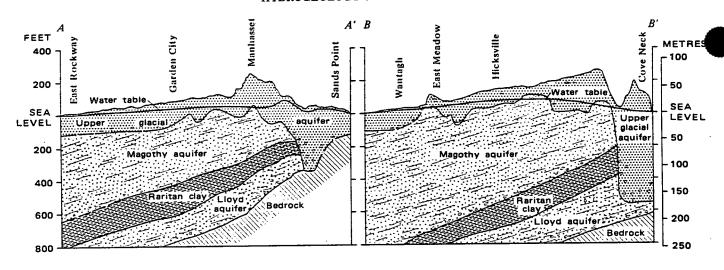
Estimates of hydraulic conductivity mapped in figures 9-11 are for flow parallel to bedding (bed parallel) (McClymonds and Franke, 1972, p. E11). Similar estimates for flow perpendicular to bedding (bed normal) within each aquifer have not been published. Franke and Getzen (1975), in working with steady-state, cross-sectional models, conclude that an

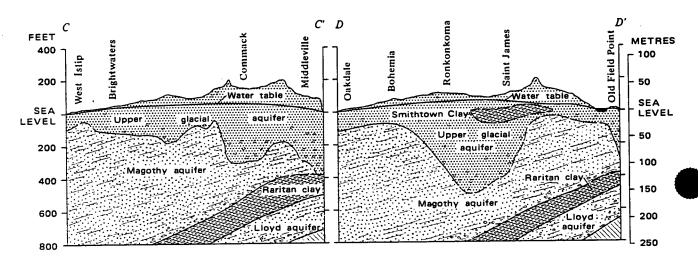


Base from U.S. Geological Survey, 1:250,000 series: Scranton, Hartford, 1962; New York, 1957; Newark, Providence, 1947

FIGURE 4.—Locations of and typical sections through the Long Island ground-water reservoir showing major hydrogeologic units.

(Geology after Swarzenski. 1963; Isbister, 1966; Jensen and Soren, 1974.)





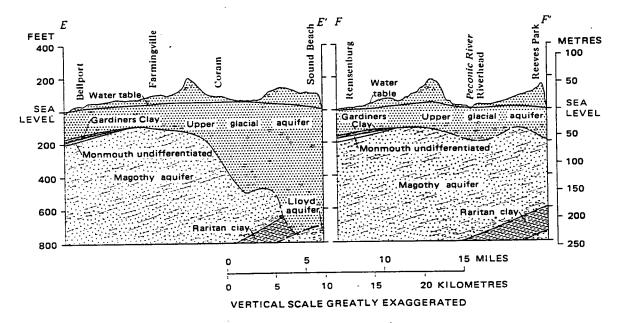


FIGURE 4.—Continued.

System	Series Holocene	Geologic unit ¹ Recent deposits: Artificial fill. salt marsh deposits, stream alluvium, and shoreline de- posits.	Hydro- geologic unit Recent deposits	Approximate maximum thickness (metres)	Depth from land surface to top (metres)	Character of deposits Sand, gravel, clay, silt, organic mud. peat, loam, and shells. Colors are gray, brown, green, black, and yel- low. Recent artificial-fill deposits of gravel, sand, clay, and rubbish.	Water-bearing properties Permeable sandy beds beneath barrier beaches yield fresh water at shallow depths, brackish to salty water at greater depth. Clay and silt beneath bays retard saltwater encroachment and confine underlying aquifers. Stream floodplain and marsh deposits may yield small quantities of water
Quaternary	Plesitocene	Upper Pleistocene deposits	Upper glacial aquifer	150	0–15	Till (mostly along north shore and in moraines; composed of clay, sand. gravel, and boulders forms Harbor Hill and Ronkonkoma terminal moraines. Outwash deposits (mostly between and south of terminal moraines, but also interlayered with till) consist of quartzose sand, fine to very coarse, and gravel, pebble to boulder sized. Glaciolacustrine deposits (mostly in central and eastern Long Island) and marine clay (locally along south shore) consist of sit, clay, and some sand and gravel layers; includes the "20-foot clay" in southern Nassau and Queens Counties. Colors are mainly gray, brown, and yellow; silt and clay locally are grayish green. Contains shells and plant remains, generally in finer grained beds; also contains Foraminifera. Contains chlorite, biotite, muscovite, hornblende, olivine, and feldspar as accessory minerals; "20-foot clay" commonly contains glauconite.	but are generally clayey or silty and much less permeable than the underlying upper glacial aquifer. Till is poorly permeable: commonly causes perched-water bodies and impedes downward percolation of water to underlying beds. Outwash deposits are moderately to highly permeable: specific capacities of wells tapping them range from about 10 to more than 200 galmin per ft (gallons per minute per foot of drawdown. Good to excellent infiltration characteristics. Glaciolacustrine and marine clay deposits are mostly poorly permeable but locally have thin, moderately permeable layers of sand and gravei; generally retard downward percolation of ground water. Contains freshwater except near the shore lines. Till and marine deposits locally retard saltwater encroachment.
		Gardiners Clay	Gardiners Clay	90	Clay, silt, and few layers of sand and gravel. Colors are grayish green and brown. Contains marine shells, Foraminifera, and lignite; also loc-	Poorly permeable: constitutes confining layer for underlying Jameco aquifer. Locally. sand layers yield small quantities of water.	
		Unconformity? Jameco Gravel	Jameco aquifer	90	15-170	Sand, fine to very coarse, and gravel to large-pebble size: few layers of clay and silt. Gravel is composed of crystalline and sedimentary rocks. Color is mostly dark brown. Contains chlorite. biotite. muscovite, hornblende, and feldspar as accessory minerals. Occurs in Kings. Queens, and southern Nassau Counties; similar deposits occur in buried valleys near north shore.	Moderately to highly permeable; contains mostly freshwater, but brackish water and water with high iron content occurs locally in southeastern Nassau and southern Queens Counties. Specific capacities of wells in the Jameco range from about 20 to 150 gal/min per ft of drawdown.

adequate representation of aquifer properties near the center of Long Island must include a substantial degree of anisotropy; bed-normal conductivities one-tenth to one-twenty-fourth of bed-parallel conductivity are suggested for the upper glacial aquifer, and bed-normal conductivities one-thirtieth to one-sixtieth of bed-parallel conductivity are suggested for the Magothy aquifer. These ranges of anisotropy are supported by four recent aquifer tests. One test in the Magothy aquifer indicated an anisotropy of 1:30: three in the upper glacial aquifer indicated anisotropy ranging from 1:1.8 to 1:2.8. These tests, however, are inconclusive and may not be representative of the aquifers.

Reliable data for the conductivity of the confining beds (Gardiners Clay and other clays in the deposits of

Cretaceous-Quaternary age that overlie the Magothy aquifer) are not available. A vertical conductivity of 2.5×10^{-5} cm/s (0.07 ft/d), characteristic of similar clay beds in Connecticut and Maryland, is reasonable for these units. Subsequent sensitivity tests conducted on the cross-sectional models of Long Island (Franke and Getzen, 1975) indicate that this estimate may be about one order of magnitude too high but that relative to the other parameters tested regional flow is insensitive to the conductivity of these beds. On a regional scale, horizontal flow in the confining beds is probably negligible.

Field data for storage coefficients of Long Island aquifers are meagre. The few data that are available indicate that the specific yield of the unconfined

HYDROGEOLOGY OF LONG ISLAND

TABLE 1.-Hydrogeologic units of Long Island-Continued

System	Series	Geologic	unit ¹	Hydro- geologic unit	Approx- imate maximum thickness (metres)	Depth from land surface to top (metres-	Character of deposits	Water-bearing properties
Tertiary (?)	Phocenet?	Mannetto Gravel Unconformity		(Commonly included with upper glacial aquifer.)	90	0-35	Gravel, fine to coarse, and lenses of sand: scattered clay lenses. Colors are white, yellow, and brown. Occurs only near Nassau-Suffolk County border near center of island.	Highly permeable, but occurs mostly above water table. Excellent infiltration characteristics.
	Upper Cretaceous	Magothy (?) Formation ²	formity ———	Magothy aquifer	340	0–160	Sand, fine to medium, clayev in part; interbedded with lenses and layers of coarse sand and sandy and solid clay. Gravel is common in basal 50-200 feet. Sand and gravel are quartzose. Lignite, pyrite, and iron oxide concretions are common: contains muscovite, magnetite, rutile, and garnet as accessory minerals. Colors are gray, white, red, brown, and yellow.	Most layers are poorly to moderately permeable: some are highly permeable locally. Specific capacities of wells in the Magothy generally range from 1 to about 30 galmin per ft of drawdown, rarely are as much as 80 gal/min per ft of drawdown. Water is unconfined in uppermost parts; elsewhere is confined. Water is generally of excellent quality but has high iron content locally along north and south shores. Constitutes principal aquifer for public-supply wells in western Long Island except Kings County, where it is mostly absent. Has been invaded by salty ground water locally in southwestern Nassau and southern Queens Counties and in small areas along north shore.
Cretaceous		Raritan Formation Lloyd Sand Member	Raritan Clay	90	20–460	Clay, solid and silty; few lenses and layers of sand; little gravel. Lignite and pyrite are common. Colors are gray, red, and white, common'y var- iegated.	Poorly to very poorly permeable: consti- tutes confining layer for underlying Lloyd aquifer. Very few wells produce appreciable water from these de- posits.	
			Lloyd aquifer	150	60-550	Sand, fine to coarse, and gravel, commonly with clayey matrix; some lenses and layers of solid and silty clay; locally contains thin lignite layers and iron concretions. Locally has gradational contact with overlying Raritan clay. Sand and most of gravel are quartzose. Colors are yellow, gray, and white; clay is red locally.	Poorly to moderately permeable. Specific capacities of wells in the Lloyd generally range from 1 to about 25 gal/min per ft of drawdown, rarely are as much as 50 gal/min per ft of drawdown. Water is confined under, artesian pressure by overlying Rari tan clay; generally of excellent quality but locally has high iron content. Has been invaded by salty ground water locally in necks near north shore, where aquifer is mostly shallow and overlying clay is discontinuous. Called "deep confined aquifer" in some earlier reports.	
Precambrian			irock	Bedrock		0-820	Crystalline metamorphic and igneous rocks: muscovite-biotite schist, gneiss, and granite. A soft, clayey zone of weathered bedrock locally is more than 100 feet thick.	Poorly permeable to virtually impermeable; constitutes virtually the lower boundary of ground-water reservoir. Some hard, freshwater is contained in joints and fractures but is impractical to develop at most places; however, a few wells near the western edges of Queens and Kings Counties obtain water from the bedrock.

¹Names are those used in reports by the Geological Survey.

²The use of the term "Magothy(?) Formation" has been abandoned. The post-Raritan Cretaceous deposits are divided into the Magothy Formation and Matawan Group undifferentiated and the Monmouth Group undifferentiated.

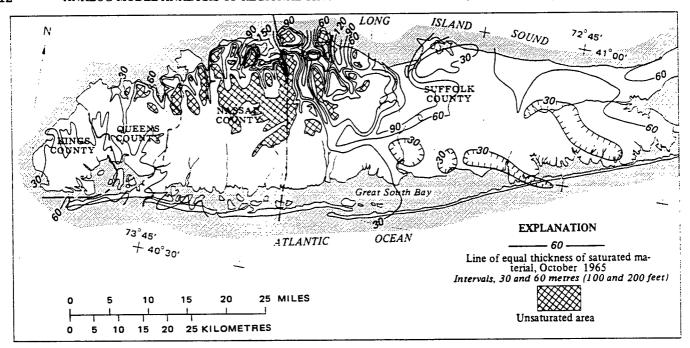
aquifer north of the Harbor Hill terminal moraine is generally less than it is in the outwash plain south of the moraine (unpublished data in Geological Survey files). A specific yield (water-table storage coefficient) of 0.10 was estimated for the area north of the line shown in figure 12 and a coefficient of 0.18, south of this line. Water-table storage coefficients were assumed for the upper glacial aquifer throughout most of Long Island. In two small areas in the north-central part of the island, the top of the saturated zone is below the glacial deposits and the top of the Magothy aquifer is unconfined with a storage coefficient of 0.10. These specific yields are minimal for sediments with a porosity of 25–30 percent. A minimal value of 2×10^{-8} cm⁻¹

 $(6\times10^{-7}~{\rm ft}^{-1})$ for compressive storage was also assumed. These estimates were based on a general appraisal of the lithology; subsequent aquifer tests tend to corroborate these values.

SURFACE WATER

LAKES

As described by Veatch, Slichter, Bowman, Crosby, and Horton (1906), lakes and ponds on Long Island occur in three different hydrologic environments. Lake Success is an example of a perched lake. This type of lake is separated from the main water table by nearly impervious strata and is common on the ground morainal deposits that form the more elevated parts of



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 5.—Saturated thickness of the upper glacial aquifer on Long Island. (After McClymonds and Franke, 1972, pl. 1.)

the island. These lakes do not influence, nor, for the most part, are they influenced by the main water table.

A second type of lake, one that is dependent on the regional water table, is much more abundant on eastern Long Island. Lake Ronkonkoma is the largest lake of this type, but Artist Lake, Long Pond, Deer Pond, Swan Pond, Great Pond, Big Fresh Pond, and Poxabogue Pond are other examples (Veatch and others, 1906, p. 63). Water is exchanged more or less freely between this type of lake and the ground-water reservoir, and when water is pumped from a lake of this type or evaporates from its surface, the lake becomes a ground-water sink; it is a large "natural well." Both types of lakes are unimportant to the regional ground-water system.

Dammed streams constitute a third class of lakes (fig. 13). Depending on whether the water level in such lakes is maintained above or below the surrounding ground-water table, such lakes can function as either ground-water sources or sinks of a local nature. Figure 13 shows that dammed streams retard the seepage of ground water into the streams along the lakeshore. The basic effect of these lakes on the ground-water reservoir is to modify the regional gradients in their vicinities—decreasing the shorewards gradients in the areas above the dams and increasing gradients below the dams. Such a lake causes a reversal in the water table slope adjacent to the stream, which prevents ground-water seepage into the stream, but the effect on both streamflow and the water table is small a short

distance upstream or downstream of the lake. In the regional analysis, each lake of this type is treated as a stream reach with little or no ground-water seepage.

STREAMS

The Nissequogue River, which has the highest average flow of any Long Island stream, had an average discharge of 1.18 m³/s (40.3 ft³/s) between 1943 and 1970 (U.S. Geological Survey, 1972, p. 37). There are four other major streams with discharges greater than 0.5 m³/s (17 ft³/s)—Peconic, Carmans, Connetquot, and Carlls Rivers. Most of the larger streams and all those with an average discharge greater than 0.3 m³/s (10 ft³/s), except the Nissequogue and Peconic Rivers, discharge along the south shore. Except for a few in the western part of the island, the streams of Long Island receive most of their flow from ground-water seepage (Cohen and others, 1968, p. 62). Seventy-five of these streams (fig. 14) are large enough so that each affects the water table and patterns of flow within the ground-water reservoir over an area greater than 2 km²; all together, these streams drain more than 13.4 m³/s (300 Mgal/d) from the ground-water reservoir.

The streams are of interest because of the way in which they are affected by changing ground-water levels and because of their changing rates of seepage from the ground-water reservoir. Even small fluctuations in water-table elevation can cause pronounced changes in stream discharge. Changes in stream dis-

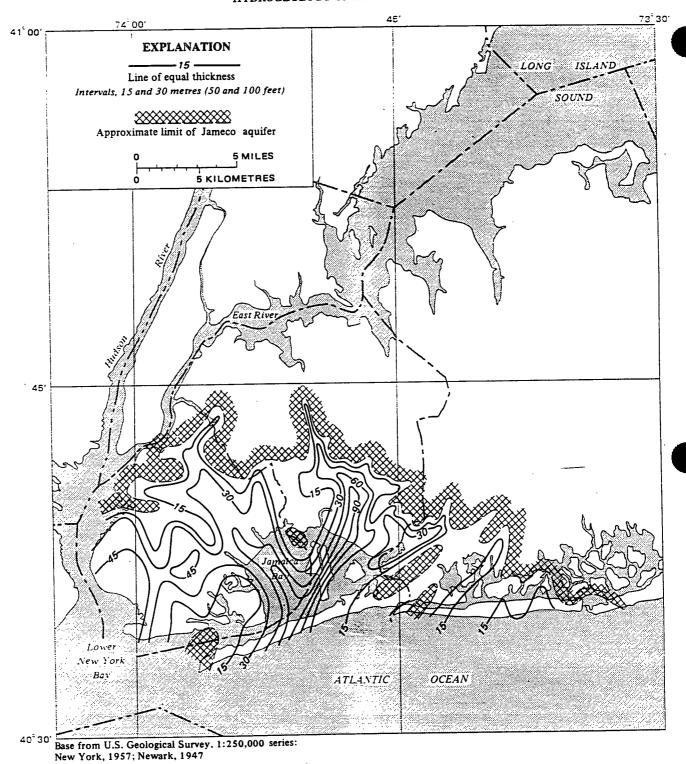


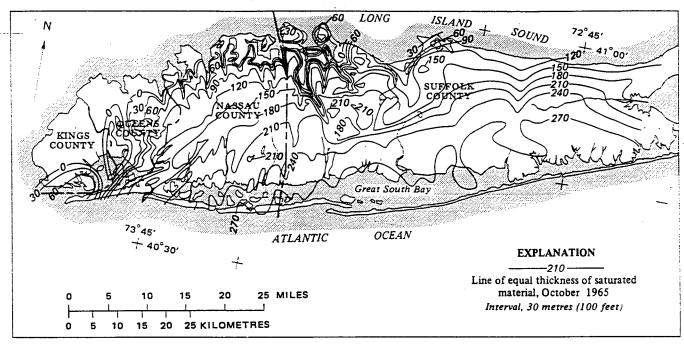
FIGURE 6.—Thickness of the Jameco aquifer. (After McClymonds and Franke, 1972, fig. 13).

freshwater lakes, (b) the influence of stream discharge slight lowering of the regional water table. on the salinity of the brackish-water bodies surrounding Long Island and the resulting effects on shell fishing and general marsh ecology, and (c) the large amounts of ground water that are diverted from

charge are of interest because of (a) recreational uses of streams to wells where pumping of the wells causes a

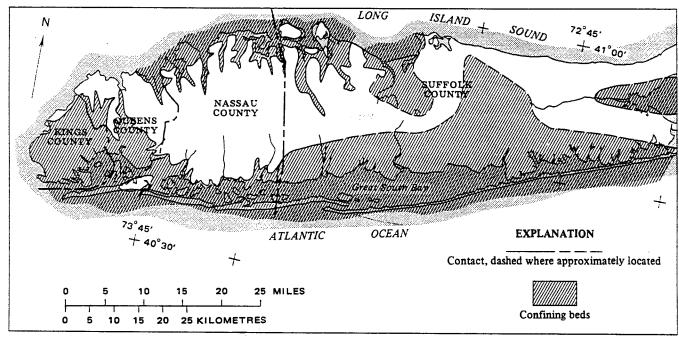
BOUNDARIES BETWEEN SALTWATER AND FRESH GROUND WATER

Fresh ground water comes into contact with bo



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 7.—Saturated thickness of the Magothy aquifer. (After McClymonds and Franke, 1972, pl. 2.)

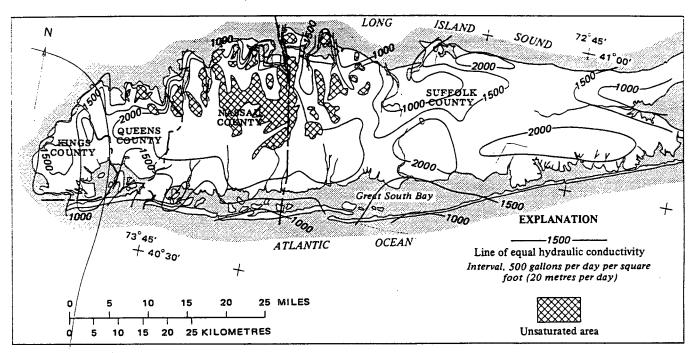


Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 8.—Extent of Gardiners Clay and other Cretaceous-Pleistocene deposits that constitute a composite confining bed overlying the Magothy aquifer. (Geology after Perlmutter and Geraghty, 1963 and N. E. McClymonds, written commun., 1970.)

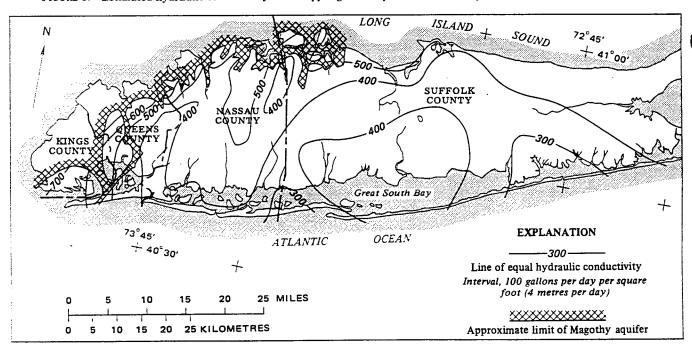
salty surface water and salty ground water. The salty | water reservoir; the bottom is said to be a specifiedbodies are independent of head within the ground- constant, or invariant with time and horizontal direc-

surface water surrounding Long Island is a significant | potential boundary. Waves and tides fluctuate so boundary to the ground-water reservoir. Any fluctua- rapidly that the fluctuations are usually ignored, and tions in head along the bottoms of the surface-water | the boundary is treated as one along which the head is



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 9.—Estimated hydraulic conductivity of the upper glacial aquifer. (After McClymonds and Franke, 1972, pl. 1.)



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962: New York, 1957; Newark, 1947

FIGURE 10.—Estimated hydraulic conductivity of the Magothy aquifer. (After McClymonds and Franke, 1972, pl. 2.)

tion. Because salty water is more dense than freshwater, the head along the boundary is a function of saltwater depth. At the bottoms of bays and oceans, freshwater heads at the sediment-water interface must balance the head resulting from the density difference—about 2.5 percent of the surface-water

depth if the body is seawater, proportionately less if the surface water is less dense than seawater. The head condition just described must always be met along the boundary between fresh ground water and salty surface water, regardless of whether the system is in equilibrium. The same head condition must be

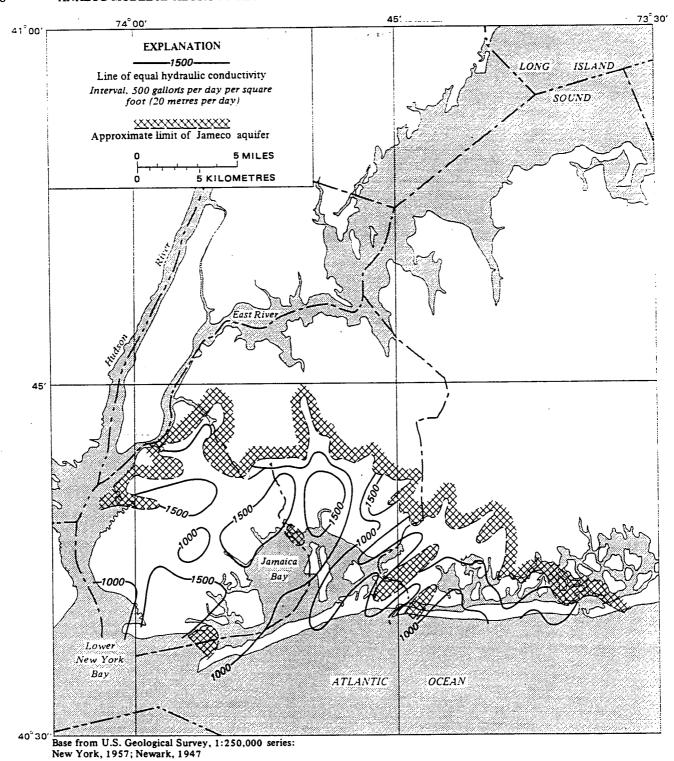
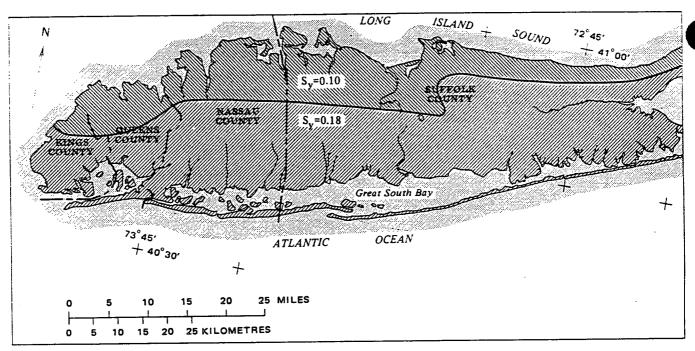


FIGURE 11.—Estimated average hydraulic conductivity of the Jameco aquifer. (After McClymonds and Franke, 1972, fig. 14.)

met for the boundary between fresh ground water and salty ground water if dynamic equilibrium is to be maintained, if the salty ground water is assumed to be static, and if the only net forces acting on the ground water are head gradients arising from gravitational forces (Hubbert, 1940, p. 868–870, 924–926).

Figure 15 is a diagram of the seaward boundary of fresh ground-water flow on Long Island showing (A) the surface along which freshwater head must balance the head caused by density differences between freshwater and saltwater and (B) the surface along which freshwater head seems to balance saltwater heads and



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 12.—Values of specific yield estimated for the water table.

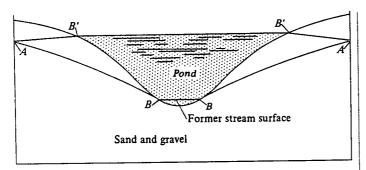
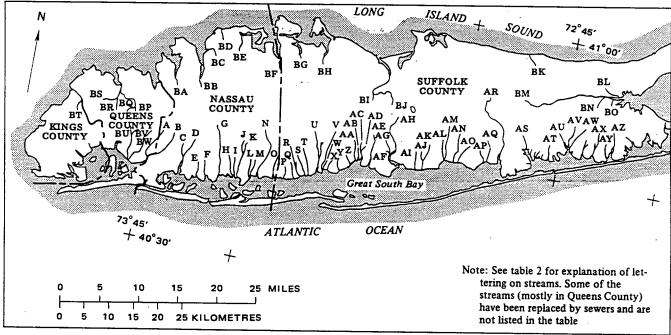


FIGURE 13.—Section across a stream valley showing water table before (A-B) and after (A-B') pond is created by damming a stream. The pond causes a reversal in the water-table slope which prevents ground-water seepage into the stream. (After Veatch and others, 1906.)

meets conditions for a classical equilibrium interface as described by Hubbert (1940, p. 868–870); (C) indicates that surface along which freshwater head seems not to balance saltwater head and along which conditions for a classical equilibrium interface are not met. An earlier discussion (p. 6) indicated that failure of heads along surfaces marked (C) to meet the conditions for a classical equilibrium interface could result from either (1) nonequilibrium conditions or (2) modification of the conditions for equilibrium by osmotic effects of the clays at and below the top of the Magothy aquifer.

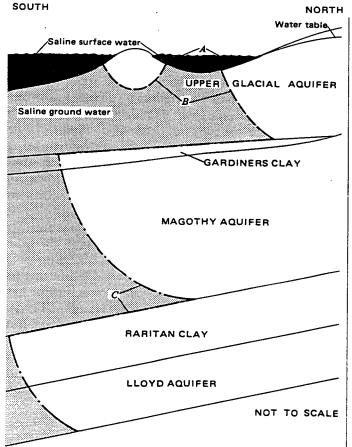
The difference in density between fresh and salty water tends to keep the two separated with the fresh ground water on top; under steady-state conditions, the interface is represented by limiting flowlines of the fresh and salty water flow systems. A limiting flowling is mathematically equivalent to a no-flow or imperm able boundary, although there is no physical impermeable boundary. Fresh or salty ground water can move across the interface through two processes-(a) bulk displacement of one type of fluid by the other or (b) dispersion or mixing of the two fluids. Under nonsteady flow conditions, either process can cause movement of the interface, but the interface would move at velocities several orders of magnitude less than the velocity at which potential transients are transmitted through the confined parts of the ground-water reservoir. Transient changes in head are transmitted across the interface as though the interface were nonexistent, but because the interface is generally some distance offshore in the confined aquifers of Long Island, head changes at the interface resulting from human activities on the island will generally be small. Movement of the interface resulting from onshore pumping would accordingly be slow. Cooper (1959) provides a useful discussion of the physics of saltwater intrusion, and Lusczynski and Swarzenski (1966) describe the occurrence of intrusion on Long

Although the preceding conclusion is true for the interface in the confined aquifer along most of the south shore of Long Island, it is not true everywher. In parts of Kings, Queens, and Nassau Counties, the interface is landward of the shoreline and adjacent to



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 14.—Locations and letter designations used for major Long Island streams.



major pumping centers, the aquifers are thinner and more highly permeable than average for Long Island, and the confining unit is discontinuous; consequently, the interface can move rapidly (locally in excess of 10 m/yr or 33 ft/yr) in response to onshore pumping.

WATER TABLE

The water table, or free surface, is a boundary to the ground-water reservoir that can move in time. In recharge areas on Long Island, the flux (rate of flow per area) to the water table generally occurs as unsaturated flow and, therefore, is not affected by heads within the reservoir. In discharge areas, the rate at which water leaves the reservoir at the water table is related to heads within the reservoir but is ultimately controlled by evapotranspiration rates. One way of treating the water table is to ignore the how and the why of changes in flux across it and to treat it as a surface across which the flux is entirely controlled by events external to the aquifer except at points where

FIGURE 15.—Schematic hydrologic section of seaward boundary of fresh ground-water flow on the south shore of Long Island showing (A) the surface along which freshwater head must balance the head caused by the density difference between freshwater and salty surface water, (B) the surface along which freshwater head seems to balance saltwater head in the aquifer, and (C) the surface along which freshwater head seems not to balance static saltwater head.

the water table intersects seeps (streams and springs). At those seeps, flow out of the upper surface of the aquifer is a linear function of the gradient towards the seep; the seep is maintained at a potential defined by its altitude.

MODEL DESIGN

BASIC ANALOG CONCEPTS AND SIMILARITY COEFFICIENTS

The sediments of the Long Island aquifer system are clearly anisotropic in their hydraulic conductivity, which is maximum parallel to the bedding and minimum at right angles to it. They are likewise heterogeneous, with extreme variations in hydraulic conductivity from place to place. The flow of ground water of uniform density and viscosity through a medium of this sort can be described in terms of two equations, as follows:

$$\begin{bmatrix} K_{xx} & K_{xy} & K_{xz} \\ K_{yx} & K_{yy} & K_{yz} \\ K_{zx} & K_{zy} & K_{zz} \end{bmatrix} \begin{bmatrix} \partial h/\partial x \\ \partial h/\partial y \\ \partial h/\partial z \end{bmatrix} = \begin{bmatrix} q_x \\ q_y \\ q_z \end{bmatrix}$$
(1)

and

$$\frac{\partial q_x}{\partial x} + \frac{\partial q_y}{\partial y} + \frac{\partial q_z}{\partial z} = \frac{S_s \partial h}{\partial t}, \qquad (2)$$

where K_{xx} , K_{xy} , ..., are the components of the hydraulic conductivity tensor; h represents hydraulic head; q_x , q_y , and q_z are the components of the Darcy velocity, or flow per unit area; t is time; and S_z is the specific storage. In this formulation, both the hydraulic conductivity tensor and the specific storage are considered functions of position—that is, the medium is considered heterogeneous as well as anisotropic. The coordinate directions, x, y, and z, are chosen arbitrarily. (See, for example, Collins, 1961, p. 63 and 72.)

Direct electrical simulation of equations 1 and 2 could be accomplished by using complex circuitry; for example, by using certain negative resistance elements. But this would be a difficult and costly procedure. A considerable simplification is possible if the medium can be considered orthotropic—that is, having three perpendicular principal axes of conductivity along at least one of which the conductivity attains its maximum value and along at least one of which the conductivity has its minimum value—and if the coordinate axes can be taken along these principal axes of conductivity. In the Long Island system, two of the principal axes can be taken parallel to the bedding. In these directions, designated x' and y', the hydraulic conductivity has its maximum value, K_A . The third principal axis, designated z', can be taken at right angles to the bedding. In this direction, the conductivity

has its minimum value, K_B . If the coordinate axes are taken along x', y', and z', equations 1 and 2 can b reduced to:

$$\frac{\partial}{\partial x'} \begin{pmatrix} K_A \frac{\partial h}{\partial x'} \end{pmatrix} + \frac{\partial}{\partial y'} \begin{pmatrix} K_A \frac{\partial h}{\partial y'} \end{pmatrix} + \frac{\partial}{\partial z'} \begin{pmatrix} K_B \frac{\partial h}{\partial z'} \end{pmatrix} = \frac{S_s \frac{\partial h}{\partial t}}{\partial t}.$$
(3)

Equation 3, which is easily simulated electrically, accounts for the heterogeneity of the system—that is, variation of K_A , K_B , and S_s with position—but assumes that the directions of maximum and minimum conductivity remain the same throughout the system. This is not strictly true in the Long Island aquifers because the dip of the sediments varies slightly with map location and with depth. The electrical simulation used in this analysis approximates equation 3 at each individual point in the aquifer but also partly accounts for variation in direction of the principal axes. In this sense, the simulation represents the ground-water system more accurately than does equation 3. In the process, however, additional errors are introduced. The errors are described later in this section.

Electrical simulation is accomplished by dividing the aquifer into blocks as shown in figure 16. Figure 16A represents a typical hydrologic section through the island; figure 16B illustrates the division of the aquifer into blocks along this section. The two uppermost layers of blocks represent the upper glacial aquifer, and the three lower layers represent the Magothy aquifer. The layers are aligned along the high-conductivity axes; that is, they are parallel to the bedding at all points. Because of the exaggeration of the vertical scale, both the dip of the various layers and the differences in dip between the layers seem to be much greater in figure 16 than they are. All dips are on the order of 1 degree.

Figure 16C shows one of the blocks of figure 16B and an array of seven nodal points in the neighborhood of this block. The head at each nodal point is indicated by the subscript notation shown in the figure. The central node lies at the centroid of the block shown in the figure, and the surrounding nodes are assumed to lie at the centroids of the six surrounding blocks. In terms of finite differences in head, the equation for approximate inflow along the x' axis is

$$Q_{x_1'} \approx K_{A_1} \frac{h_1 - h_0}{(\Delta x')_1} (\Delta y' \Delta z')_1 ,$$

where the subscript 1 indicates that the various terms are taken between node 1 and node 0. The hydraulic conductivity, K_{A_1} , is an average value for this interval, as is the flow area $(\Delta y'\Delta z')_1$. The symbol $(\Delta x')_1$ is simply the distance between node 1 and node 0. Equation 4 can be obtained by applying Darcy's law to flow through the right face of the block, expressing the derivative $\frac{\partial h}{\partial x}$ by a Taylor series expansion, and neglecting terms of higher order than the first in the resulting series.

The equation for approximate outflow along the x' axis is

$$Q_{x_2'} \approx K_{A_2} \frac{h_0 - h_2}{(\Delta x')_2} (\Delta y' \Delta z')_2$$
, (5)

where subscript 2 indicates values for the interval between node 0 and node 2. Therefore, inflow minus outflow in the x' direction is approximately

$$Q_{x_1}' - Q_{x_2}' \approx \left(\frac{K_{A_1}(\Delta y' \Delta z')_1}{(\Delta x')_1} (h_1 - h_0)\right) - \left(\frac{K_{A_2}(\Delta y' \Delta z')_2}{(\Delta x')_2} (h_0 - h_2)\right)$$
(6)

Similar expressions, using parallel subscript notation, can be developed for inflow minus outflow in the \mathcal{Y}' and z' directions. When this is done, the total inflow minus outflow may be equated approximately to the rate of accumulation of fluid in storage in the block, $S_s(\Delta V) \frac{\partial h}{\partial t}$

where ΔV represents the volume of the block.

This leads to the equation

$$\frac{K_{A_1}(\Delta z' \Delta y')_1}{(\Delta x')_1} (h_1 - h_0) - \frac{K_{A_2}(\Delta z' \Delta y')_2}{(\Delta x')_2} (h_0 - h_2)
+ \frac{K_{A_3}(\Delta z' \Delta x')_3}{(\Delta y')_3} (h_3 - h_0) - \frac{K_{A_4}(\Delta z' \Delta x')_4}{(\Delta y')_4} (h_0 - h_4)
+ \frac{K_{B_5}(\Delta x' \Delta y')_5}{(\Delta z')_5} (h_5 - h_0) - \frac{K_{B_6}(\Delta x' \Delta y')_6}{(\Delta z')_6} (h_0 - h_6)
\approx S_{s_0} \left(\frac{(\Delta x')_1 + (\Delta x')_2}{2} \times \frac{(\Delta y')_3 + (\Delta y')_4}{2} \right) \frac{\partial h}{\partial t} \cdot (7)$$

Equation 7 is simplified considerably by making $\Delta x' = \Delta y'$ for all blocks. In this case,

$$K_{A_{1}} (\Delta z')_{1} (h_{1}-h_{0}) - K_{A_{2}} (\Delta z')_{2} (h_{0}-h_{2})$$

$$+ K_{A_{3}} (\Delta z')_{3} (h_{3}-h_{0}) - K_{A_{4}} (\Delta z')_{4} (h_{0}-h_{4})$$

$$+ \frac{K_{B_{5}} (\Delta x' \Delta y')}{(\Delta z')_{5}} (h_{5}-h_{0}) - \frac{K_{B_{6}} (\Delta x' \Delta y')}{(\Delta z')_{6}} (h_{0}-h_{6})$$

(8)

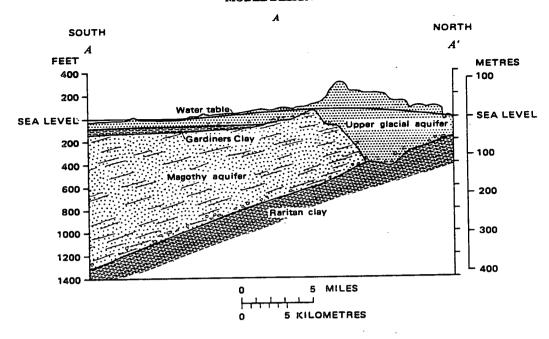
 $\approx S_{s_0} \Delta x' \Delta y' \frac{(\Delta z')_5 + (\Delta z')_6}{2} \frac{\partial h}{\partial t}$

Equation 8 may be regarded as a finite-difference (in space) approximation to equation 3, using the block configuration shown in figures 16 and 17 and keeping $\Delta x' = \Delta y'$ throughout. As suggested previously, however, equation 8 simulates conditions in the aquifer (equations 1 and 2) more closely than it simulates equation 3. Equation 3 requires that the principal conductivity axes remain fixed throughout the system, whereas in reality they do not. A simulation of field conditions that is superior in certain ways to one that would be given by a direct, finite-difference approximation of equation 3 can be obtained by changing the orientation of the blocks to follow approximately the changing directions of maximum and minimum conductivity.

Errors associated with a finite-difference approximation using a uniform rectangular mesh have received extensive attention in the literature; for example, Karplus, (1958, p. 103–108). If, as in this example, the mesh is not perfectly rectangular, additional errors are introduced. The increase in $\Delta z'$ in the downdip direction implies that the downdip flow through a block must diverge, rather than remain entirely parallel to x'; thus, it cannot be completely accounted for by a term approximating only $\frac{\partial h}{\partial x'}$. In addition, the upper or

lower surface of a block may not be perfectly perpendicular to a line between the centroid of the block and that of the overlying or underlying block. In this case, flow across the surface cannot be exactly described in terms of a head difference between the centroids. Magnitude of the errors generated by these causes is difficult to estimate and would vary from place to place in the system. However, because the dip is very low and the changes in dip are both small and very gradual, errors of this sort would probably be negligible throughout the system.

A direct electrical analog of equation 8 is easily constructed. Karplus and Soroka (1959), Skibitzke (1961), Bermes (1960), and Walton and Prickett (1963) discuss both the theoretical basis and the technique of such electrical simulation. Figure 16D shows an electrical configuration in which six resistors are used to connect a central node, or junction, with six surrounding nodes.



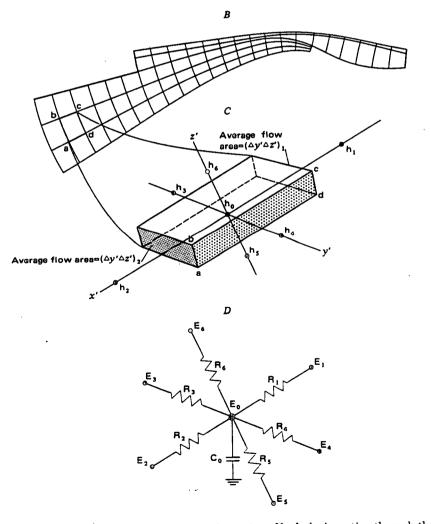


FIGURE 16.—Finite-difference representation and notation of hydrologic section through the Long Island ground-water reservoir (thickness greatly exaggerated): A, A typical hydrologic section B, This section divided into blocks, or finite-differences C, Expansion of one block from this section showing the principal conductivity axes, x', y', and z'; also head at the centroid of this block, h_0 , and at the centroids of six surrounding nodes, h_1 , h_2 , ... h_6 . D, An electrical analogy for flow in this block with voltages E_0 ... E_6 analogous to heads h_0 ... h_6 , resistances R_1 ... R_6 , and capacitance C_0 .

A capacitor connected to the central node provides electrical storage at this point. Voltage at the central node is designated E_0 , and voltages at the surrounding nodes are designated $E_1, \ldots E_6$, respectively, which parallels the notation used for heads in equations 4 through 8. The current (I_1) toward the central node through resistor R_1 is given by Ohm's law as

$$I_1 = \frac{1}{R_1} (E_1 - E_0), \tag{9}$$

where R_1 is the resistance between the central node and node 1. The current (I_2) from the central node to node 2 is similarly given by

$$I_2 = \frac{1}{R_2} (E_0 - E_2). \tag{10}$$

Expressions similar to equations 9 and 10 can be obtained for the currents toward and away from the central node in the other directions. The algebraic sum of these currents must equal the rate of accumulation of charge on the capacitor at the central node, which is given by $\frac{C_0}{dt} \frac{dE_0}{dt}$, where C represents the capacitance.

$$\frac{1}{R_{1}}(E_{1}-E_{0}) - \frac{1}{R_{2}}(E_{0}-E_{2}) + \frac{1}{R_{3}}(E_{3}-E_{0}) - \frac{1}{R_{4}}(E_{0}-E_{4}) + \frac{1}{R_{5}}(E_{5}-E_{0}) - \frac{1}{R_{6}}(E_{0}-E_{6}) = C_{0}^{\frac{dE_{0}}{dt}}.$$
(11)

Equation 11 is of the same form as 8, where voltage is analogous to head, the terms $\frac{1}{R_1}\dots\frac{1}{R_4}$ are analogous to the terms $K_{A_1}(\Delta z')_1\dots K_{A_4}(\Delta z')_4$, the terms R_5 and R_6 are analogous to $\frac{K_{B_5}(\Delta x'\Delta y')}{(\Delta z')_5}$ and $\frac{K_{B_6}(\Delta x'\Delta y')}{(\Delta z')_6}$, and C_0 is analogous to $S_{s_0}\Delta x'\Delta y'\frac{(\Delta z')_5+(\Delta z')_6}{2}$.

Thus, if a three-dimensional network of resistors and capacitors is constructed and subjected to electrical stresses that are proportional to hydraulic stresses in the ground-water system, the voltage of each node of the network should vary in proportion to the head in the corresponding block of figure 16B. Equation 11 provides a means by which head changes in response to proposed or assumed stresses can be predicted without resort to extended field experiment.

For the uppermost layer of a three-dimensional analog network, the term K_{B_5} of equation 8 is zero; the

term $\frac{1}{R_5}$ of equation 11 is similarly taken as zero. For the lowermost layer, the terms K_{B_6} and $\frac{1}{R_5}$ are zero. If

the uppermost layer corresponds to a water-table zone, the capacitance C at each node in this layer is taken to represent the term S_y $\Delta x' \Delta y'$, where S_y represents specific yield, rather than the specific storage term of equation 8; in an interval that includes the water table, virtually all withdrawal from storage is sustained by dewatering rather than by release from compressive storage.

The electrical analogy may be summarized in terms of four similarity coefficients, any three of which may be considered independent. These are as follows:

$$V = A_1 q$$

$$h = A_2 E$$

$$Q = A_3 I$$

$$t = A_4 t',$$

where the quantities left of the equal sign are prototype¹ (real world) quantities and those on the right are model quantities. V is volume of water, q is electrical charge, h is head, E is electrical potential, Q is rate of discharge of water, I is electrical current, t is prototype time compared with model time t'; and the coefficients A_1 - A_4 have the dimensions necessary for the appropriate conversions. The model study is described in terms of the following units:

MODEL MATRIX

This model was designed around the similarity coefficients (A_1-A_4) and the data presented earlier in this report. The aquifers were split into several zones. The five levels of the model correspond to five zones of the prototype. None of these zones or levels corresponds to a distinct sand unit within an aquifer. In order to comply with the restrictions discussed in the section on basic analog concepts, the zones are approximately parallel to bedding within each aquifer, and, therefore, they vary in thickness and altitude from point to point. The bed-normal spacing, $\Delta z'$, between finite-difference nodes ranges from zero (where an aquifer pinches out)

¹The term "prototype" is used to designate the real-world hydrologic system as opposed to the model hydrologic system.

up to about 120 m (400 ft). The bed-parallel node spacings, $\Delta x'$, and $\Delta y'$, are both 6,000 ft (1,829 m) for all the zones. The finite-difference grid in figures 16B and 17 shows the even-numbered rows and columns that are spaced at 6,000-ft (1,829-m) intervals. The nodes are "volume centered"; that is, they are at the centroids of the volumes they represent.

On the basis of the values of hydraulic conductivity in figures 9-11 and of aquifer thicknesses in figures 5-7, the model area for each of the five levels was subdivided into areas in which the bed-parallel hydraulic conductivity and thickness could be assumed to be reasonably uniform. Figures 18 and 19 show the distribution of transmissivity (product of thickness and bedparallel hydraulic conductivity) about each node in levels 1 and 2 of the model, which represent the upper glacial aquifer. Specified-potential boundaries are shown by the symbol "*", and impermeable or no-flow boundaries by " ϕ " on these maps. Figure 20 shows the transmissivity assigned to level 3; this level includes the Jameco aquifer and the upper third of the Magothy aquifer. Distribution of transmissivity in levels 4 and 5, representing the middle third and lower third of the Magothy aquifer, are mapped in figures 21 and 22.

All vertical resistances were computed on a node-by-node basis because of the complex variations in thickness, aquifer conductivities, and confining beds that they represent. In computing vertical resistances, an anisotropy of 1:10 was assumed for the upper glacial and Jameco aquifers and 1:40 for the Magothy aquifer. Thickness of the confining beds overlying the Magothy aquifer is divided between levels 2 and 3. Figures 23-25 show the distribution of estimated values of $(\Delta z'/K_B)$. Because R_z' is directly proportional to

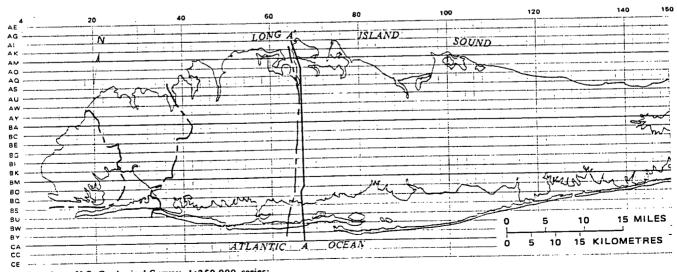
$$\frac{1}{\Delta x' \Delta y'} \times \frac{\Delta z'}{K_B}$$
 and $\Delta x' \Delta y'$ is constant throughout the

model, R_s can be computed directly from the values mapped in figures 23–25. The distribution of estimated values of $(\Delta z'/K_B)$ between levels 4 and 5 is the same as that given in figure 25 for levels 3 and 4, except that the lower level is not quite as extensive.

The Lloyd aquifer (table 1; fig. 4) was not included in this model. The aquifer is well isolated from the remainder of the ground-water reservoir by the Raritan clay (Franke and Getzen, 1975), and its hydrologic properties are poorly known (McClymonds and Franke, 1972; Jensen and Soren, 1974). The Lloyd aquifer is used as a source of water in only a few places on Long Island. Thus, its inclusion is not necessary either for utilization or for correct operation of the model. The top of the Raritan clay was treated as an impermeable bottom for the flow system.

Lack of detailed information on specific storage of the aquifers required a somewhat more general assignment of capacitance. Two different values of capacitors, corresponding to the two areas shown in figure 12, were used in level 1. In a few places where the upper glacial aquifer is not saturated (figs. 4, 5), capacitors appropriate to water-table storage coefficients were used for the corresponding nodes in level 2 (fig. 16). Level 2 was assigned a compressive storage coefficient where it represents saturated material. Because level 2 is closely connected, both electronically and hydrologically, to level 1, it exhibits all the characteristics of a water-table aquifer except when subjected to very fast transient stresses.

Figure 8 and the geologic cross sections in figure 4



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 17.—Finite-difference grid used for constructing the three-dimensional model of Long Island, and location of section A-A'.

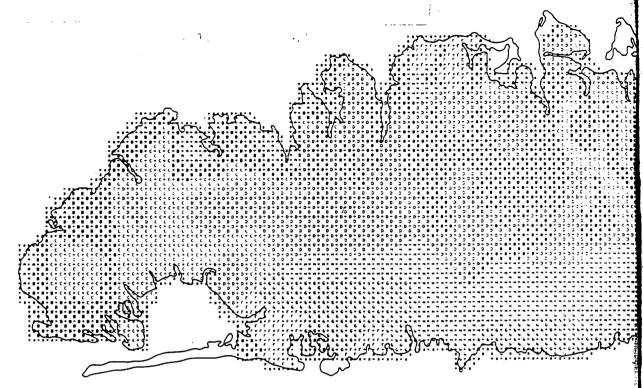


FIGURE 18.—Distribution of transmissivity (product of thickness and bed-parallel hydraulic conductivity) about each node in level 1 (uppermost level) of the model.

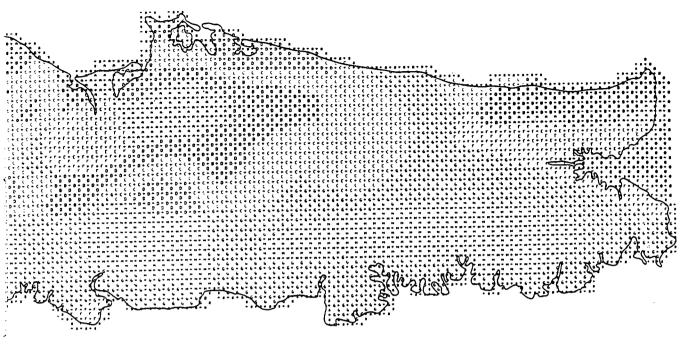
show that there are no continuous island-wide confining beds stratigraphically above the Raritan clay. Upper Cretaceous sandy clays (correlated with the Monmouth Group by Jensen and Soren, 1972), the Gardiners Clay, and the Pleistocene Smithtown and "20-ft" clays together comprise an aggregate confining unit that is stratigraphically above the Magothy aquifer around the fringes of Long Island. The Magothy aquifer and deeper parts of the glacial aquifer exhibit confined hydrologic behavior.

Compressive storage controls short-term response of confined aquifers such as the Magothy aquifer and deeper parts of the glacial aquifer on Long Island; water-table, or gravity, storage controls long-term response. Compressive storage contributes to the total storage in all aquifers but is usually of negligible importance in unconfined aquifers. None of the Long Island aquifer tests before construction of the model provide data that are adequate for separating the two types of storage. An average specific storage of 2×10^{-8} cm⁻¹ (6.1×10⁻⁷ ft⁻¹) was assumed. This value, multiplied times an average thickness of 200 m (650 ft) yields the storage coefficient of 4×10^4 , which was distributed uniformly to all nodes except where watertable storage was assigned. Rigorously, the amount of storage assigned each node should be proportional to the volume represented by the node. This was not done

because of the lack of data to support the storage coefficient that was assumed. The author considered that the assigned storage would have to be modified during model testing, so one value of capacitor was used throughout. During testing, this assignment of storage seemed adequate.

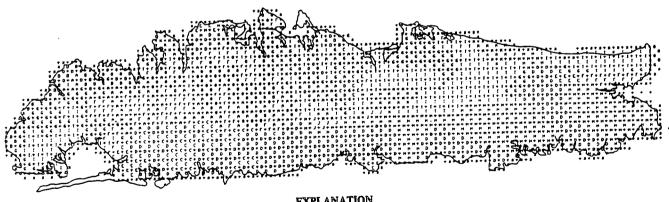
Four aquifer tests after the construction of the model indicate a specific storage for these semiconfined aquifers ranging from 10⁻⁷ to 10⁻⁶ cm⁻¹ (3×10⁻⁶ to 3×10⁻⁵ ft⁻¹) (Getzen, 1974, p. 53), at least one order of magnitude greater than the values used in the model design. Even with the larger values, the effects of elastic storage on long-term response are insignificant when compared with water-table storage for most of the Long Island reservoir. Around the fringes of the island, where the confining unit is thickest and more nearly continuous and where the overlying units are saturated with seawater, model accuracy is more sensitive to the accuracy of the assumed value for specific storage. This sensitivity is one reason to question the model's predictive capability in the offshore area.

The large size of the model caused some concern about the effects of stray capacitance on performance of the model. The mechanics of construction require large amounts of wire connecting nodes on each level to the corresponding nodes on the levels above and below, and much of this wire (more than 70,000 ft or 21,000



- Model node
- Specified-potential boundary
- Impermeable boundary (no transmissivity)
- Transmissivity=93 square metres per day
- Transmissivity=160 square metres per day
- Transmissivity=220 square metres per day
- Transmissivity=280 square metres per day
- Transmissivity=330 square metres per day
- Transmissivity=550 square metres per day
- Transmissivity=760 square metres per day Transmissivity=980 square metres per day

FIGURE 18.—Continued.



EXPLANATION

- Model node
- Specified-potential boundary
- Impermeable boundary (no transmissivity)
- Transmissivity=370 square metres per day
- Transmissivity=930 square metres per day Transmissivity=990 square metres per day

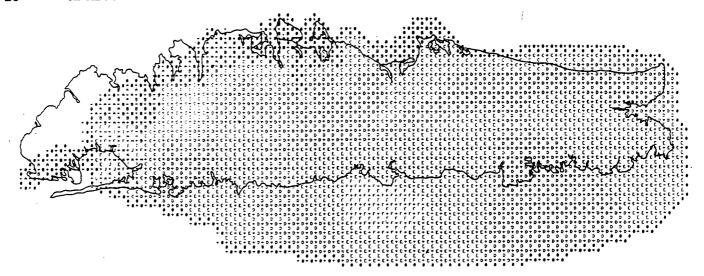
- Transmissivity=500 square metres per day
- : Transmissivity=3,700 square metres per day
- Transmissivity=3,000 square metres per day . Transmissivity=5,300 square metres per day

c Transmissivity=1,200 square metres per day

Transmissivity=1,500 square metres per day

Transmissivity=1,700 square metres per day

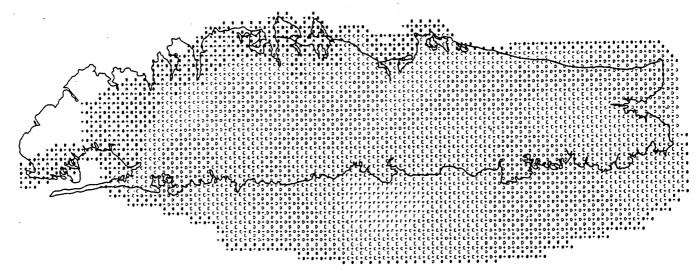
- Transmissivity=5,900 square metres per day
- FIGURE 19.-Distribution of transmissivity (product of thickness and bed-parallel hydraulic conductivity) about each node in level 2 of the model.



- Model node
- · Impermeable boundary
- Transmissivity=120 square metres per day
- Transmissivity=120 square metres per day
 Transmissivity=310 square metres per day
- Transmissivity=620 square metres per day

 Transmissivity=620 square metres per day
- Transmissivity=990 square metres per day
- Transmissivity=1,550 square metres per day
 Transmissivity=1,550 square metres per day
- Transmissivity=1,740 square metres per day
- · Transmissivity=2,200 square metres per day
- * Transmissivity=3,600 square metres per day
- Transmissivity=5,500 square metres per day
 Transmissivity=6,300 square metres per day
- Transmissivity=9,100 square metres per day
- Transmissivity=9,100 square metres per day
 Transmissivity=15,000 square metres per day

FIGURE 20.—Distribution of transmissivity (product of thickness and bed-parallel hydraulic conductivity) about each node in level 3 of the model.



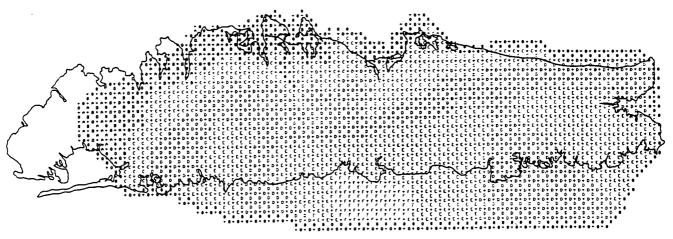
EXPLANATION

- Model node
- Impermeable boundary (no transmissivity)
- Transmissivity=120 square metres per day
 Transmissivity=310 square metres per day
- Transmissivity=620 square metres per day
- Transmissivity=990 square metres per day
- Transmissivity=1,600 square metres per day
- r Transmissivity=1,700 square metres per day

FIGURE 21.—Distribution of transmissivity (product of thickness and bed-parallel hydraulic conductivity) about each node in level 4 of the model.

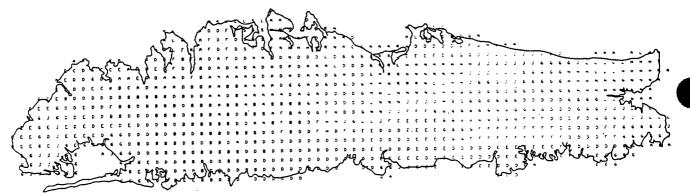
m) must be bundled into tight cables. Preconstruction estimates of the capacitance between adjacent nodes were on the order of 3–10 pf (picofarads). Postconstruction measurements have indicated that stray capacitance may be as high as 15 pf between some nodes.

Although some nodes near boundaries show a total capacitance to ground of 45 pf, most of the nodes in the interior part of the model have a total capacitance of 26–31 pf with respect to ground. Therefore, some variation in aquifer storage is not accounted for in design



- · Model node
- Impermeable boundary (no transmissivity)
- Transmissivity=120 square metres per day
 Transmissivity=310 square metres per day
- Transmissivity=620 square metres per day
- Transmissivity=990 square metres per day
 Transmissivity=1,500 square metres per day
- Transmissivity=1,700 square metres per day

FIGURE 22.—Distribution of transmissivity (product of thickness and bed-parallel hydraulic conductivity) about each node in level 5 of the model.



EXPLANATION

Bed-normal thickness/bed-normal hydraulic conductivity

130 days 57 days 22 days 5.6 days ε 170 days 68 days 6.8 days 26 days 220 days 81 days 10 days 39 days 290 days 99 days 15 days 48 days

Figure 23.—Distribution of estimated values of $(\Delta z'/K_B)$ between nodes in levels 1 and 2 of the model, where $(\Delta z'/K_B)$ is thickness divided by bed-normal hydraulic conductivity.

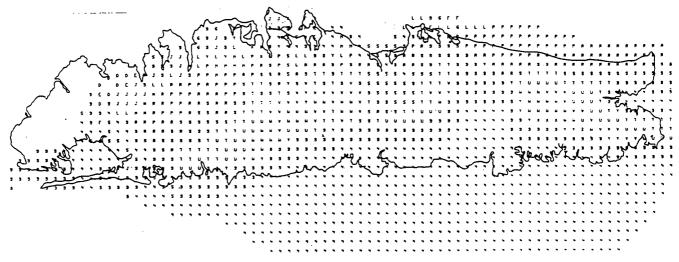
criteria, but the discrepancy seems negligible when compared with the design capacitance of 27 pf per node.

BOUNDARY CONDITIONS

Five types of boundary conditions are incorporated into model design: (1) Boundaries across which no flow occurs; (2) boundaries along which the potential is defined by potential sources external to the model; (3) boundaries across which the flow is defined by external sources; (4) internal stresses whose magnitude and location are defined by external sources; and (5) stream boundaries across which the flow is controlled by both internal and external events. (As used here, the only

differences between a boundary of type 3 and one of type 4 are size and position. In other authors' terminology, all specified-flux boundaries are referred to as "stresses.")

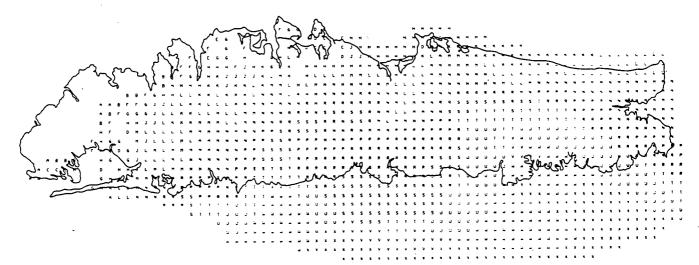
1. No-flow boundaries—The top of the Raritan clay is assumed to be an impermeable or no-flow boundary as is the interface between freshwater and salty water in the Magothy aquifer. Unfortunately, the interface is not a fixed boundary for steady-state flow and is no boundary at all for unsteady flow. Even if it were a boundary, the position of the interface in the Magot aquifer is virtually unknown. The assumption is the somewhere offshore is a point beyond which freshwater



Bed-normal thickness/bed-normal hydraulic conductivity

```
• 120 days
              • 1,200 days
                             - 3,500 days
130 days
              - 1,300 days
                               3,900 days
 180 days
              * 1,600 days
                               15,000 days
 220 days
              1,900 days
                               26,000 days
                              150,000 days
 500 days
              1 2,300 days
                               480,000 da 15
               2,900 days
  640 days
              v 3,200 days
                              1,000,000 days
 750 days
 950 days
```

FIGURE 24.—Distribution of estimated values of $(\Delta z'/K_B)$ between nodes in levels 2 and 3 of the model, where $(\Delta z'/K_B)$ is thickness divided by bed-normal hydraulic conductivity.



EXPLANATION

Bed-normal thickness/bed-normal hydraulic conductivity

en-normal filickin	ess/ bed-normal nyo	TLANIIC COMMUCIAL
 220 days 	1,500 days	 6,200 days
 230 days 	1,900 days	s 6,800 days
4 290 days	 2,600 days 	¹ 7,400 days
 350 days 	3,200 days	9,000 days
430 days	 3,900 days 	 9,900 days
- 900 days	 4,800 days 	■ 12,000 days
4 1 100 days	• 5 700 days	aveb DOD E1

FIGURE 25.—Distribution of values of $(\Delta z'/K_B)$ between nodes in levels 3 and 4 and between nodes in levels 4 and 5 of the model, where $(\Delta z'/K_B)$ is thickness divided by bed-normal hydraulic conductivity.

THE REAL PROPERTY AND ADDRESS OF THE

flow and the effect of head changes on the island are nated several miles offshore during construction of the negligible. The Magothy aquifer was simply terminodel. Location of this termination was then adjusted

during calibration and verification procedures until the steady-state heads and vertical gradients resembled the prototype heads and gradients beneath the barrier beaches—as far seaward as prototype data permit.

- 2. Known-potential: boundaries—The shoreline around the island is a specified-potential boundary for the upper glacial aquifer. This potential is determined by external voltage sources and serves as a reference altitude for most model measurements. The upper surface of the Gardiners Clay offshore is maintained at the same potential as the shoreline. This is equivalent to assuming that (a) the density of seawater is not significantly different from that of freshwater and (b) that head losses in the sea-bottom sediments above the clay are negligible. These assumptions are acceptable because the depths of salty water above the clay are small and because the quantity of freshwater leaking through the offshore part of the Gardiners Clay is small.
- 3. Specified-flux boundaries—Recharge to the upper surface of the model can be either steady-state or steady-state with superposed transients. In each of these recharge modes, this surface is a specified-flux boundary. The flux into each node is equal to the longterm average recharge for the area in the first mode, but in the second the flux varies with time as well as space. Flux across the water table is controlled by external current sources and resistor networks that divide the current into the proper proportions for each water-table node. Steady-state rates of recharge are controlled by current-regulated power supplies; recharge rates that vary with time are achieved by superposing a transient current on the steady-state current. In the latter case, op amps (operational amplifiers) with diode-protected low-impedence output and resistance networks are used to isolate the transient electronic sources from the steady-state source.

Most models are designed to analyze response to transient stresses without reference to steady-state recharge. The way in which the streams are simulated in the experiments described herein rendered such operation undesirable, as explained in (5).

4. Internal stresses—Sources and sinks at nodes that are not on a bounding surface of the model are referred to as internal stresses. Stresses of this type include pumping from the aquifer system and (or) injection through wells and basins. These stresses are supplied by pulse generators and function generators, whose output is buffered by op amps. The op amps isolate the outputs of the pulse generators from each other so that it is possible to produce "step" and "ramp" approximations for stresses that vary with time. "Step" and "ramp" approximations, in which stresses change

either in discrete steps or as a linear function of tircan be good approximations for many stresses. At though "ramp" and "step" functions may be gross representations of historical prototype stresses that vary irregularly in time and space, the model reservoir, as the prototype, tends to smooth out the response to rapidly changing stresses. The results are usually acceptable. The electrical stress is provided by currents (equivalent to rates of recharge and discharge) that vary with time. The low output impedence of the op amps makes this possible. Figure 26 shows the system for producing transient stresses.

The slow-rate generator shown in figure 26 provides a common reference time for measuring instruments as well as the signal generating equipment. Delay units start different pulse generators at various times after this reference time.

5. Stream boundaries—Streams are nonlinear boundaries on the system; their effect varies as a function of head within the model. Streams in the model have been represented by several different types of electrical circuits, all of which have been developed empirically without any attempt to represent the equations for open-channel flow. For the steady-state calibration studies, the streams were modeled by simple resistor networks as is shown in figure 27.

In order for these steady-state streams to repres the prototype streams, two conditions must be met at each stream node: (1) Flow out of the model network through each node must represent seepage into the stream reach represented by the node, and (2) head at the node must represent an "average" elevation of the water table in the area represented by the node. (This average elevation is assumed to be equal to the elevation of the stream surface). In the model (fig. 27A), a string of resistors was connected in parallel with the stream nodes. Thus, the voltage drop across each resistor in the string equalled the voltage drop between successive stream nodes of the model. The current flowing into each junction along the string of resistors (that is, leaving each stream junction of the model network) represents the ground-water seepage into the stream reach. Current $(I_R \text{ in fig. } 27A)$ carried by any resistor in the string represents the sum of all the seepage currents upstream from that point. In Long Island, where streams derive almost all their flow from ground-water seepage, this current must increase downstream in a normal, steady-state configuration.

Each resistor was chosen so that when the voltage drop across the resistor (E_1-E_2) was proportional to the head drop (h_1-h_2) between successive node points the steady-state prototype system (fig. 27B), the rent I_{R1} through the resistor was proportional to the cumulative discharge Q_{R1} in the stream reach. This

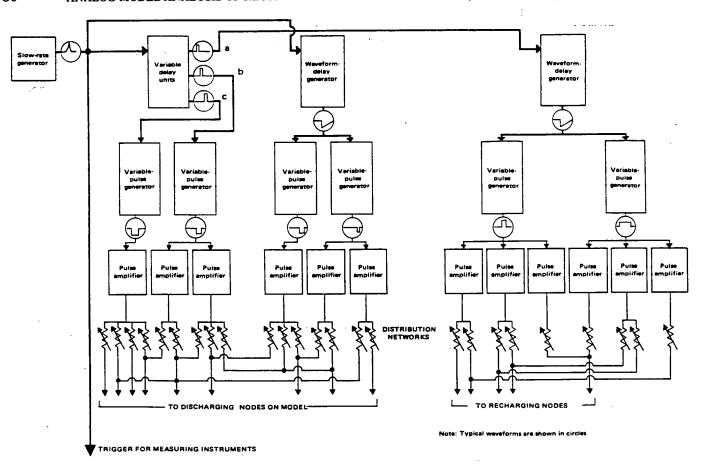


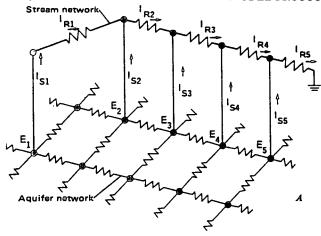
Figure 26.—Method for producing transient analog stresses. The distribution networks allow superposition of waveforms so that complex patterns of pumping and recharge can be approximated.

insured that, at every junction, the seepage currents I_S would be proportional to the ground-water seepage Q_S into the stream in the block represented by the junction. The configuration in figure 27A assures that, when the steady-state voltages, $E_1, E_2, \ldots E_n$, correctly represent steady-state heads, $h_1, h_2, \ldots h_n$, along the channel, the current out of each stream node will be proportional to the seepage into the stream in that reach.

The type of circuit in figure 27A can only represent ground-water seepage to a stream in the steady-state configuration for which the circuit was specifically designed, not in a transient situation in which heads beneath the stream may change with time. In the prototype system, seepage to streams rapidly decreases to zero as heads decline; when heads fall below stream level, the direction of seepage is reversed. If the flow in the affected stream reach is sustained by inflow to the stream in upstream areas, this seepage into the aquifer may continue; however, if the head in all upstream areas has similarly dropped below stream level, the stream will simply dry up everywhere above the first point at which ground-water head exceeds stream level. In the dried-up part of the stream, there will be

no seepage in either direction between the stream and the ground-water system. Behavior of this type was observed in nearly all streams on Long Island during the drought of the 1960's.

To simulate the type of stream-aguifer condition observed during the drought, the circuit in figure 27 was modified by replacing each stream resistor with a resistor and diode in series. The diodes and resistors were chosen so that with potentials $E_1, E_2, \ldots E_n$ representing the prototype steady-state heads $h_1, h_2, \ldots h_n$, the forward resistance of each diode-resistor combination would be the same as the resistance of the resistor alone in figure 27A. If downstream gradients (that is, the voltage drop between successive nodes) were to decrease as a result of transient stresses, the diode resistance would increase and would effectively stop streamflow in the affected reach. If, for example, E_1 were to decline while E_2 remained constant, when E_1 – E_2 dropped below the junction threshold voltage for the diode between nodes 1 and 2, the current I_{R1} would drop to zero. Reduction of I_{R1} would result in a reduction in I_{R2} and in the current carried by each subsequent reach of the simulated stream. As heads throughout the model aquifer continued to decline in



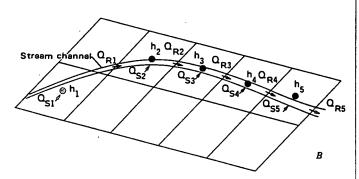


FIGURE 27.—Circuit diagram of a model stream (A) showing voltages $E_1, E_2, \ldots E_n$ and currents $I_{R1}, I_{R2}, \ldots I_{Rn}$ along the stream and currents $I_{S1}, I_{S2}, \ldots I_{Sn}$ into the stream. A prototype stream channel (B) indicates the values of head $(h_1, h_2, \ldots h_n)$, represented by the voltages, and discharges Q_R and Q_S represented by the currents in the model. Each junction in the model network represents one of the aquifer blocks in the prototype.

response to a simulated drought, E_2 would eventually decline until E_2 – E_3 was less than the threshold voltage for that diode and I_{R2} would decrease to zero. The stream would be shortened at its head.

Although model operation with the two stream circuits, as well as model operation without streams, proved useful for the model-performance analyses described in the section "Model-Prototype Comparisons," they were not adequate for some predictive studies. A third circuit, different in concept and more difficult in execution, has been used for predictive studies. Because the third circuit was not used in any of the analyses described in this report, a description of that circuit will be deferred to a later report (A. W. Harbaugh and R. T. Getzen, written commun., 1975).

SUMMARY OF DESIGN CRITERIA

be correctly represented by the model are as follows:

- (1) Geometry and distribution of hydraulic conduc tivity in the reservoir rocks. For Long Island, distribution of conductivity is three dimensional, and magnitude of conductivity is direction dependent. The finite-difference network must be alined with the directions of the principal conductivities.
- (2) Average magnitude of the specific storage of the reservoir rocks and spatial distribution of storage.
- (3) Location of boundaries of the hydrologic system and nature of the boundaries. Where this is not completely possible, the boundaries were designed to have minimal effect on the internal parts of the model. The lower boundary of the Magothy aquifer and the saltwater-freshwater interface are not exactly represented by the model. The model attempts to minimize the effects of these boundaries.
- (4) Historical data on internal stresses to the reservoir and electronic-exciting circuitry capable of representing these stresses.
- (5) Ground-water discharge to surface-water bodies. Where this seepage is to streams and its magnitude is likely to change drastically as a function of small head changes within the ground-water reservoir, the model must be capable of correctly representing the change in seepage.

If the model can reproduce observed and calculated distributions of head in response to observed (historical) stresses and synthetic stresses, all the preceding conditions are assumed to have been met. The model is then said to be "calibrated" or "verified." Such a verification procedure does not prove that the model ground-water reservoir will respond correctly to all stresses; it only shows that the representation of responses to a certain range of stress situations seems to correlate with observed prototype response.

MODEL-PROTOTYPE COMPARISONS

PERFORMANCE CRITERIA

Model performance is generally evaluated in terms of the preceding design criteria. Most of these criteria cannot be adequately defined by prototype data. The best known of these criteria on Long Island is the general configuration of the water table. Historical data describing the water table are shown from Burr, Herring, and Freeman (1904); Veatch, Slichter, Bowman, Crosby, and Horton (1906); Jacob (1945); Isbister (1959); and Kimmel (1971). In a thin, isotropic aquifer, the configuration of the water table would be adequate for defining correct steady-state operation of the model. The same cannot be said for regional flow systems in thick, anisotropic sedimentary sequences (Freeze and Conditions of the ground-water reservoir that must | Witherspoon, 1967, p. 632-633). Sufficient data to permit description of the head distribution at other depths have been acquired only recently (Kimmel, 1971; Jensen and Soren. 1974). Because measurements are almost never made before ground-water development begins, data that reflect human as well as climatological influences on the ground-water system must be used to estimate and extrapolate the distribution of steady-state head.

Model performance is measured by two types of tests—steady-state tests, which measure the model's ability to represent average or predevelopment hydrologic conditions, and unsteady-state tests, which compare the model's response to transient stresses with prototype response to historical stresses.

Evaluation of unsteady (transient) model performance requires two types of data—quantitative measurements of the stress (pumping, recharge, fluctuating lake levels, and other boundary conditions) and historical responses (changes in head and discharge over long periods of time) of the system to those stresses. Two types of unsteady stresses were considered in evaluating model performances: (1) Changes in net recharge that resulted from the severe drought of the early 1960's and (2) historical pumping records from major wells or well fields in western Long Island. Data for magnitude of the type 1 stresses are from Cohen, Franke, and Foxworthy (1968), and for type 2 from records compiled by New York State Water Power and

Control Commission and by county agencies. Simulated response to the climatological stress was compared with the observations by Cohen, Franke, and McClymonds (1969). Response and recovery of the simulated water table to pumping stresses was compared with water-table data compiled by Lusczynski (1952) and from other sources cited in the preceding paragraph. Data from several of these sources are reproduced in subsequent illustrations for comparison with model response.

In addition to stress and head data, records of stream discharge are compared with simulated stream discharge. Streams on Long Island are seldom gaged at more than one point along their length; except for a few seepage runs and qualitative information about tidal fluctuations and location of the heads of streams in varying hydrological circumstances, there is only one point on each stream at which the model can be compared with prototype data.

STEADY-STATE EVALUATION

The average annual ground-water recharge has been estimated to be 58 cm (23 in.) for a water-budget area that excludes the highly urbanized areas and low-lying coastal areas of Long Island (Cohen and others 1968, p. 44–45). This value was used as a starting point for steady-state calibration of the model but yielded unsatisfactory results. The estimate of Cohen, Franke,

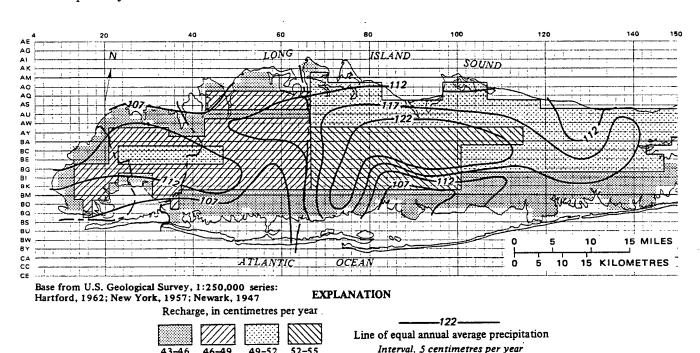


FIGURE 28.—Distribution of prototype mean annual precipitation, 1951-65, and of steady-state recharge to the model. (Mean annual precipitation modified from Miller and Frederick, 1969.)

(2 inches per year)

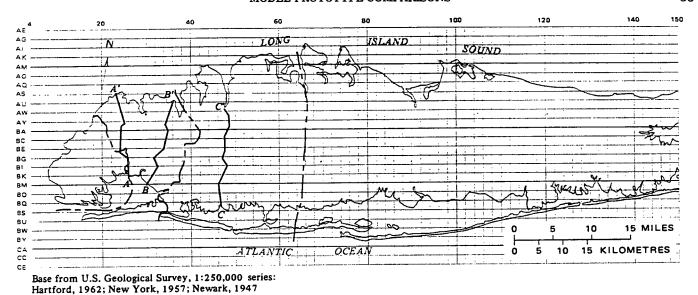
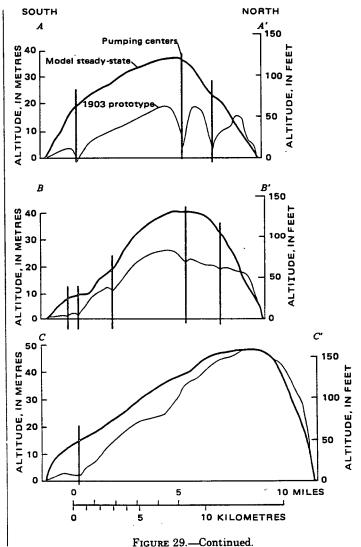
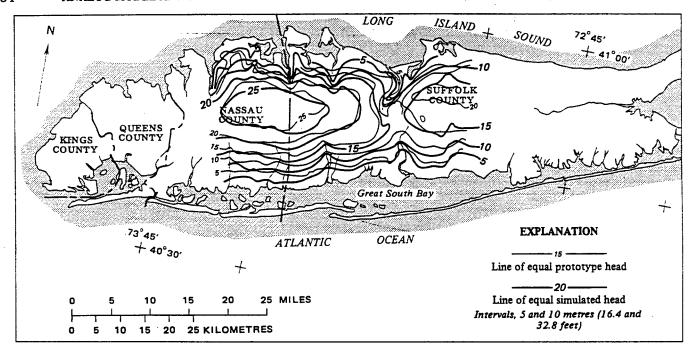


FIGURE 29.—Simulated, steady-state, water-table profiles and locations on western Long Island compared with 1903 prototype water-table profiles. Major production wells near profiles in 1903 are also shown. Prototype data from Burr, Hering, and Freeman (1904).

and Foxworthy (1968) seems to be too high if applied to the entire island. Several factors influence the rates of recharge; the most important seem to be (a) rate and duration of precipitation, (b) infiltration characteristics of the surficial sediments, (c) thickness of the unsaturated zone, and (d) local relief. Precipitation is not uniformly distributed over Long Island (fig. 28) but is noticeably greater near the center of the island than elsewhere. The soils of the morainal parts of Long Island tend to be less permeable than the soils of the outwash areas. Thus, there is a tendency for a greater proportion of the precipitation to run off near the north shore. Steep slopes, like those on the north shore, tend to cause precipitation to run off faster than it does on gentle slopes. Much more of the water that infiltrates the soil is lost to plant roots and to evaporation where the water table is close to the surface; a smaller proportion of rainfall becomes part of the ground-water reservoir in low-lying, swampy areas than in areas of greater altitude. The combination of all these factors does not reduce to an equation from which the steadystate recharge values shown in figure 28 could be calculated. These known factors make the recharge distribution in figure 28 seem reasonable, but other factors, unknown or misunderstood, could influence recharge rates in entirely different ways. The distribution of model recharge shown in figure 28 was obtained through a "tuning" process. The gross estimate by Cohen, Franke, and Foxworthy (1968) was assumed to be acceptable; distribution of this recharge was modified by trial and error until a reasonable water table was obtained.

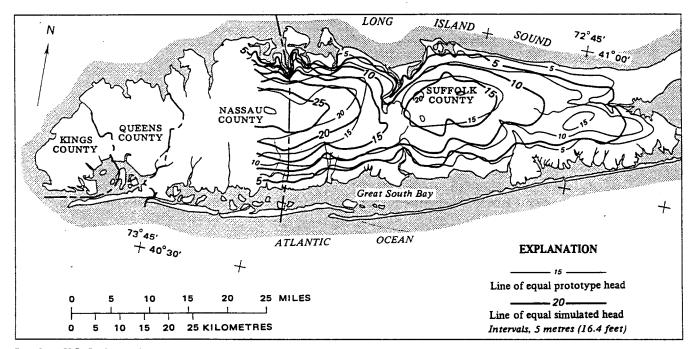
With the recharge distribution shown in figure 28,





Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 30.—Comparison of steady-state model water table with 1903 water table in central Long Island. (Prototype data from Veatch and others, 1906.)

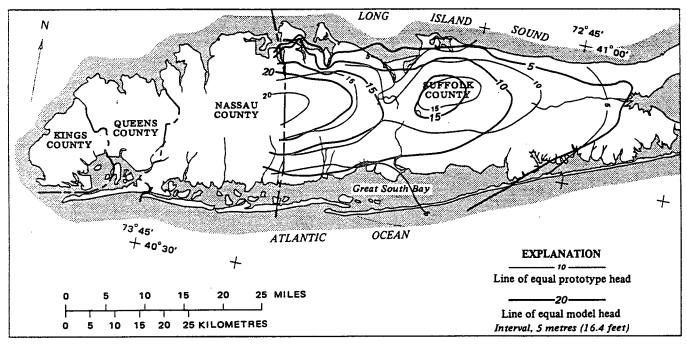


Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 31.—Comparison of steady-state model water-table with 1970 water table in eastern Long Island. (Prototype data from Kimmel, 1972.)

the model produced the steady-state, water-table configuration that is compared with observed prototype water-table data in figures 29–31. Figure 29B shows water-table profiles along three lines of section in western Long Island; locations of these lines of section are shown in figure 29. Pumpage and other manmade

hydrologic disturbances began in western Long Island and gradually spread eastward. The 1903 water levels for the westernmost part of the island reflect these manmade disturbances. The steady-state model analysis did not simulate these manmade effects, and, therefore, agreement between the model results and



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 32.—Comparison of steady-state simulated head near the base of the Magothy aquifer with 1971 prototype head. (Prototype data from Jensen and Soren, 1974.)

the 1903 water levels is poor for the westernmost line of section A-A' in figure 29. The agreement improves progressively to the east as the manmade effects diminish. The poor agreement along line A-A' may also reflect that the model design is based on saturated thickness of the glacial aquifer in 1970; the saturated thickness in 1903 was considerably greater than it was in 1970 for part of Kings County. Model performance in the westernmost part of Long Island could not be justified by the preceding comparison but was justified by unsteady-state performance (next section).

For the eastern two-thirds of the modeled area, agreement between the prototype water table and model results was good, as shown by the maps of figures 30 and 31. Figure 30 shows a comparison of steady-state model results with a water-table map by Veatch, Slichter, Bowman, Crosby, and Horton (1906) covering eastern Nassau and western Suffolk Counties. Effects of pumpage were negligible in these areas at that time. Because the map by Veatch, Slichter, Bowman, Crosby, and Horton (1906) does not include the easternmost one-third of the modeled area, figure 31 shows a comparison of model results with 1970 water-table contours by Kimmel (1972) for Suffolk County. Again, the effects of pumpage on water levels in Suffolk County were small in 1970.

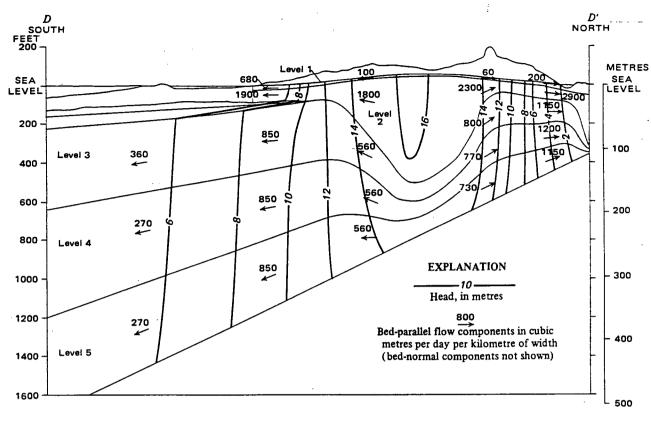
Comparison of heads near the base of the Magothy aquifer in 1971 with simulated steady-state head in model level 5 is shown in figure 32. Data for only the eastern half of the island are shown; heads in the lower part of the Magothy aquifer have been noticeably af-

fected by pumping in the western half of the island.

Extent of agreement between prototype and model heads is not perfect but is within a few metres for most of the reservoir for which reliable data are available on undisturbed natural (predevelopment) potential. Some of the disagreement is probably due to differences in data interpretation; for example, other water-table maps such as that by Cohen, Franke, and Foxworthy (1968, plate 2E), do not show the same pronounced high in southeastern Suffolk County as that indicated by the 15-m (49-ft) closed contour in this area in figure 31.

Distribution of normal, steady-state head along two typical model hydrologic sections is shown in figure 33. Although there are no satisfactory prototype data for comparison, model head and flow data given in the hydrologic sections are useful for understanding the flow system.

Table 2 compares long-term average stream discharge with values of steady-state stream discharge from the model. Where a range of discharge is given for the simulated stream discharge, the prototype gage is near the division between two stream reaches on the model. Most pairs of model and prototype stream discharges agree within ± 5 percent, and all pairs except for about ten streams agree within ± 10 percent. Only short streams and streams that have extremely high or extremely low gradients have model discharges that differ significantly from prototype discharges. The difference between total stream discharge as modeled and the long-term average for all prototype streams com-



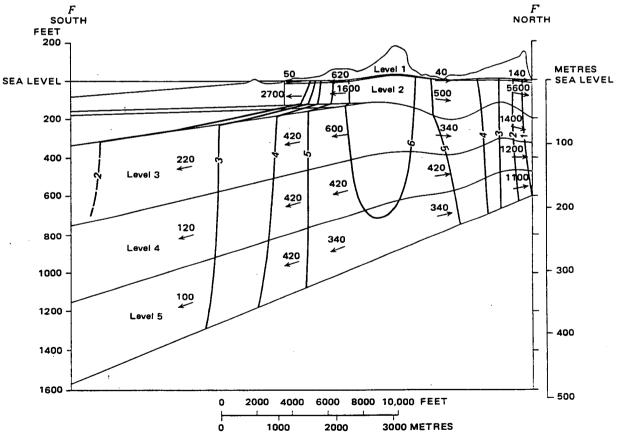


FIGURE 33.—Distribution of head and bed-parallel components of ground-water flow along two hydrologic sections through the model Long Island ground-water reservoir. Rates of flow are for a 1-kilometre-wide strip. Locations of sections are shown in figure 4.

TABLE 2.—Streamflow comparisons

Code shown for streams in figure 141	Stream name	Average discharge (cubic metres per second)	Model discharge (cubic metres per second)
B	Valley Stream	0.165	0.186
B C	Dines Brook	.141	.150
Ď		.083	.094
E	Parsonage Creek	.117	.100 .271
F G	Milburn Creek	.242 .473	.575
G	East Meadow Brook	.239	.265
H	Cedar Swamp Creek	.066	2.048 to .070
į.	Newbridge CreekBellmore Creek	.310	.435
j	Seamans Creek	.054	.050 to .058
L M	Seaford Creek	.054	.064 to .084
N.	Massapequa Creek	.339	.304 to .438
Ñ O	Carman Creek	.120	.136 to .154
Ď	Amityville Creek	.110	.059 to .102
P Q R S T U	Creek Creek	.071	.075 to .142
Ř	Strongs Creek Neguntatogue Creek	.054	.052 to .082
ŝ	Neguntatogue Creek	.108	.066
Ť	Santanogue Creek	.120	.165
Ü	Carlls River	.772	1.01
		.967	1.05 . 397
v	Sampawams Creek	.342	.034 to .055
W	Shookwams Creek	.031	.074 to .100
W X Y Z	Willets Creek	.071 .051	.058
Y	Trues Creek		.048 to .080
	Cascade Creek		.185 to .212
AA	Penataquit Creek		.063
AB	Orowoc Creek		.080
AC AD	Pardees Pond		.066 to .107
ΑĒ	Champlin Creek		.247 to .343
ĀĒ	West Brook	.120	.096
ĀĠ	Pattiernaka Brook	.262	.248 to .277
AH	Connetquot River	1.10	1.02
AI			.131
AJ.	Brown Creek (west)	231	.245 .245
AK	Brown Creek (east)	201	.116 to .171
AL	Tut Hills Creek	174	.528 to .653
AM	Patchogue Creek	365	.354
AN	Swan River	.153	.145 to .154
AO	Motts Brook	.051	.013 to .070
AP AQ	Beaverdam Creek	.046	.039
AQ AR	Carmans River	.048	.055
AIL	Carmana Milli	.678	.518
AS	Forge River	.274	.298
AT	Terrel River	071	.069
AŬ	Little Seatuck	128	.135
AV	Seatuck Creek	162	.205
AW	East River	071	.082
AX	Beaverdam Creek	068	.055 to .057 .070
AY	Aspatuck Creek	063 060	.069
AZ	Quantuck Creek	.071	.061
BA	Roslyn Brook	.051	066
BB BC	Glen Cove Creek	.202	.206
BD	Island Swamp Brook		.031
BE	Mill Neck Creek	.268	.121
BF	Cold Spring Brook	126	.130
BG	Mill Creek	060	.047
BH	Stony Hollow Kun	034	.046
BJ	NE Nissequogue	051	.086
		.111	.114 1.28
7.17	*** - 3' Ti	1.18	.026
BK	Wading RiverSaw Mill Creek		.042
BL	Peconic River	.986	1.00
BM BN	Little River	.125	.137 to .168
BO	White Brook		.086

¹Codes for only 64 of 75 streams plotted in figure 14 are listed. Eleven of the 75 streams. most of them in Queens County, have been replaced by sewers.

²A range of discharge indicates that prototype gage falls at or near division between two

reaches on model.

bined is less than 5 percent. The ability of the simulated streams to represent prototype discharge correctly at one or two points (the gages) on each stream does not mean that the overall representation is correct. There are no prototype data relating changes in seepage along the entire length of each stream to changes in the water table, but the general agreement of the model response with the available historical data strongly suggest that the response of the prototype system is closely simulated by the model.

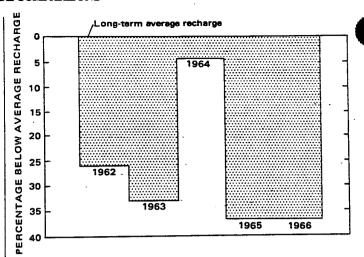


FIGURE 34.—Changes in annual recharge used to simulate the 1962-66 drought on Long Island.

UNSTEADY-STATE EVALUATION

Two historical stresses were used for unsteady-state evaluation. The first of these, the drought of 1962-66, was simulated by using estimates of the reduction in recharge during the drought (Cohen and others, 1968, plate 4E). Yearly deviation from the long-term, average annual recharge, derived from the estimates, is shown in figure 34. This stress has two causes: (1) Reduced precipitation and (2) sporadically occurring precipitation. During the drought, intense storms were the source of much of the precipitation. Although most precipitation on Long Island is rapidly absorbed by the soil, intense storms contribute large amounts of runoff to streams and fill surface ponds that evaporate. Very little of the storm precipitation becomes ground-water recharge.

The intensity of the drought stress, as given by Cohen, Franke, and Foxworthy (1968) and in figure 34, is a net or total stress. Just as was the case with average recharge distribution (fig. 28), the areal distribution of drought shown by the map in figure 35 was derived by a trial-and-error procedure aimed at reproducing the prototype response. Distribution of stress, mapped in figure 35 in terms of deviation from the islandwide areal average stress, was assumed to be constant from year to year during the drought. The trial-and-error method involved trying three different stress distributions: (1) Drought stress was uniformly distributed over the entire island; (2) stress in the lowlying parts of the island was five times greater than that in the higher, central part of the island; and (3) stress in the low-lying parts of the island was twice as great as that in the center of the island as depicted in figure 35. In each of these three stress distributions,

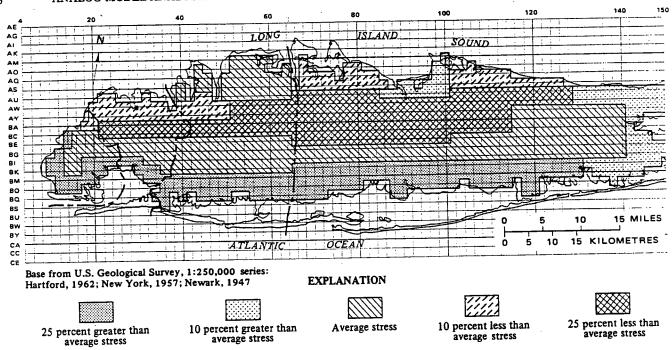
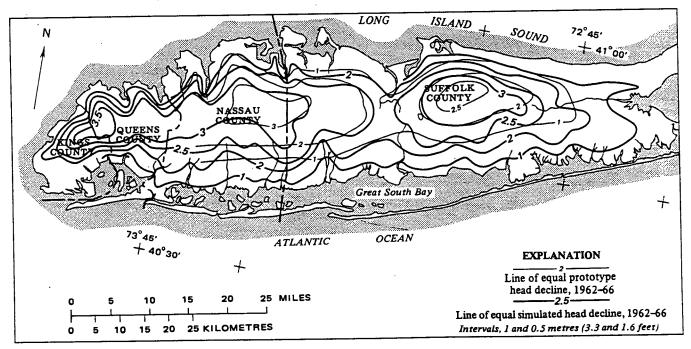


FIGURE 35.—Distribution of the decline in net recharge used to simulate the 1962-66 drought on Long Island. The distribution is given in terms of deviation from the islandwide areal average of the stress.



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

FIGURE 36.—Comparison of observed and simulated water-table declines as a result of the 1962-66 drought. (Prototype water-table decline from Cohen and others, 1969.)

the total stress during each time period was equal to the quantity indicated in figure 34.

Simulated response to the assumed stress situation is compared with the net-change map (fig. 36) presented by Cohen, Franke, and McClymonds (1969, fig.

10), who mapped the change in the water table between 1961 and 1966. Their map does not show net changes in New York City and western Nassau County because changes in water levels there are the result of other influences. Changes in recharge caused by pav-

CHONORES CONT. Saturding 1. ft.

Table 3.—Net recharge (positive) and withdrawal (negative) at each model node used to simulate manmade historical stresses in western Long Island during the periods 1903-33, 1934-42, 1943-50, and 1951-63. Unstressed nodes are not listed [Accuracy of these measurements is about ±2 percent or ±40 cubic metres per day, whichever is greater]

		LEVE	L I			FEAEF	. 2			LEVE	L 3	
	-1903-33	1934-42	1943-50	1951-63	1903-33	1934-42	1943-50	1951-63	1903-33	1934-42	1943-50	1951-63
MODEL	c	UBIC METR	ES PER DAY	,	Cu	BIC METRE	S PER DAT	•	C	UBIC METR	ES PER DA	ř
10 B¤	-12920.		-5960。	-2980.	0.	0.	0.	٥.	٥.	0.	0.	0.
12 86	-9948.		-4970.	-2040.	0.	0.	0.	٥.	0.	0.		0.
14 BC	-8846		-4420.	-1790.	0.	9. 9.	9. 9.	0. 0.	0. 0.	0.		0. 0.
14 BE	-22160.		-10680. -6950.	-4970. -1490.	0. 0.	0.	0.	0.	0.	0.		0.
14 86	-7450	-19308	-07508	-1440	••	••	-	•••	•••		_	
14 BI	~500.	-6950。	-5960。	0.	0.	-550。	-5460.	-1790.	0.	٥.		. 0.
16 BC	-20670.	-17730.	-9980.	-4620.	0.	0.	0.	0.	٥.	٥.	٥.	0.
16 BE	- 7950,			-1640.	0.	0.	0.	0.	٥.	0.	0.	0.
16 86	-5460,	-9940.	-7950.	-990.	0.	0.	0.		. 0.			0. 0.
16 BI	0.	0.	0.	0.	-990。	-7950.	-3 480.	-200.	٥.	0.	0.	٠.
16 BK	-5020	-4520。	-3530。	-500.	٥.	٥.	0.	0.	٥.	0.	0.	0.
16 BH	-6460			0.	o.	ő.	o.	0.	ő.	ō.		0.
17 BA	-12820		-6160.	-2880.	ō.	ō.	ō.	0.	ů.	0.		0.
18 88	-10180			-2090.	0.	0.	0.	0.	0.	0.		0.
18 BC	0.			0.	0.	-84 50 .	-10930.	-11920.	0.	0.	٥.	0.
	_	_	_			450	-4470.	-1490.	٥.	٥.	٠ .	0.
18 BE	0.			0.	0. -1990.	-450. -12920.	-3970.	-500.	0.	0.		0.
18 86	.0 -29810.			0. -1990.	-1440.	9152500	0.	-500.	0.	0.		ŏ.
18 BI 19 AZ	-9240			-1890.	0.	o.	Õ.	Ŏ.	o.	ō.		ō.
19 86	-4920			-500	o.	o.	o.	ō.	0.	0.		0.
.,		,				_						
20 AU	-3430	-1940.	-1790.	-1940.	0.	0.	0.	0.	0.	0.	0.	0.
20 AY	-3530			-2040.	0.	0.	٥.	0.	0.	0.	0.	0.
20 BA	-9090			-1840.	0.	0.	0.	0.	0.	0.	0.	0.
20 BC	-8350			-1690.	0.	0. -20860.	0.	0. -990.	0.	0. 0.		0. 0.
50 B6	0	. 0.	0.	٥.	-3970.	-20860.	-9940.	2990.	0.	•	•	••
20 BI	0	. 0.	0.	٥.	-5120。	0.	0.	0.	٥.	0.	0.	0.
22 AU	-3230			-1840.	0.	0.	0.	0.	0.			0.
22 AU	-8940			-4470.	0.	0.	0.	٥.	0.	0.	. 0.	0.
22 AY	-3480			-1990.	0.	0.	0.	0.	٥.			0.
22 BA	-3480	1990.	-1840.	-1990.	0.	0.	٥.	0.	0.	0.	0.	٥.
		_			٠. ٥.	0.	0.	0.	0.	0.	0.	0.
22 86	-990		0. -1940.	0. -2090.	0.	0.		0.	0.		. 0.	ŏ.
24 AU 24 BA	-3680. -3130			0.	ő.	0.		o.	0.		0.	o.
24 B6	-3130			ŏ.	o.	ő.		ŏ.	-9940.			
26 BA	-1640			Ö.	0.	0.	0.	0.	0.	٥.	. 0.	0.
				,								
26 BC	-3130		. U.	ì.	٥.	0.		٥.	0.			
26 BG	-6360	9090.	-12120.	-11570.	0.	٥.		2.	-3870.			
26 BI	0		0.	0.	0.	٥.	٥.	0. 0.	-3870. 0.			
28 BC	-1940			0. -13910.	0. 0.	0. 0.		0.	-600 ₋			
28 BE	-24840	09/0.	-13410.	-13910.	••	••	•••	••	-000	-0400		20.00
28 BG	-5070	7300.	-9740.	-9290.	0.	٥.	0.	0.	0.			
28 81	-8450	. 0.	٥.	0.	0.	0.	٥.	0.	0.			
30 BC	-21360	1990.	-990.	٥.	0.	٠.	0.	0.	o.			
30 BE	-7950				0.	٥.	0.	0.	٥.			
30 86	-4970	7950.	-8940.	-11920.	0.	0.	٥.	0.	0.	0.	. 0.	٥.
30 81	0	. 0.	. 0.	0.	٥.	0.	0.	0.	-6060.	-300.	-300.	0.
30 BI	-1490		0.	0.	0.	õ.		ō.	0.	0.		
32 BC	-1490			o.	0.				-600.	-840.	-1040.	-2090.
32 86	ŏ			o.	0.	٥.			-1990.			
35 81	ō			0.	0.		0.	0.	-15900.	-5960	3780.	-990.
			_	_	_	_	•		-3970.	-5560	-4470.	-5560.
32 89	0				0.	0.	0.		-3970.		44/0.	
34 AY	-3970				0. 0.				0.	. 0.	. 0.	
34 BE	-11920 -1990				0.				-8450	-4070	-1190	· .
34 81		•			-4820.				-0450,			
36 AY	0	. 0		v.	40 E U o	• •	• •	₩.	•		. ••	

ing and building, ground-water withdrawals through pumping wells, and sewering have strongly affected the water table in the western part of Long Island. Considering the assumptions that underlie the recharge estimates (Cohen and others, 1968, p. 44), the extent of agreement between simulated and observed changes in the water table is quite satisfactory.

Although direct measurements of net recharge are

not available—only gross estimates based on other components of the hydrologic cycle, some of which can only be approximated—the decline in recharge during a drought would probably be distributed unequally. The assumed distribution of stress (fig. 35) is not unrealistic because the erratic frequency and intensity of precipitation during the drought (Cohen and others, 1969, p. F8) resulted in much greater runoff than nor-

Table 3.—Net recharge (positive) and withdrawal (negative) at each model node used to simulate manmade historical stresses in western Long Island during the periods 1903-33, 1934-42, 1943-50, and 1951-63. Unstressed nodes are not listed—Continued

LEVEL 3						LEVEL 2				LEVEL .		
51-6	+3-50 l'	4-42 194	03-33 19	3	50 1951-	-42 1943	03-33 1934	51-63	343-50 19			
	PER DAY	METRES !	CUBI		DAY	METRES PE	CHAIC					ARS
	٥.					HEIRES PE	COSIC		PER DAY	IC METRES	CUB	DE
-835	-3830.	0. ·2980. ·	0. -790.	0.	0.	0.	0.	-6950.	-5120.			
-845	-4170.			0.	٥.	0.	0.	-7950.	-6750.	-4320.	-350.	BC
10	-500.	-2980.		0.	0.	0.	0.	-6810.	-5020.	-5960.	-5960.	8E '
-50	-4970.			0.	· O •	0.	0.	0.	-5020.	-4220.	-350.	9G
	47.00	-37101	-700.	0.	0.	0.	0.	ŏ.		0.	0.	BI
	0.	٥.		_				••	-500.	-500.	-1490.	BK
-99	-990.	-940.	٥.	0.	٥.	0.	0.	-2140.	-1290.	_		
-835	-3830.		0. -790.	0.	0.	0.	o.	0.		0.	٥.	BP
-720	-3280.			٥.	0.	0.	0.	-7050.	0. -5170.	0.	0.	BC
-596	-3970.		-700.	٥.	0.	0.	o.	0.		-4370.	-350.	BE
• • • • • • • • • • • • • • • • • • • •	-39100	-2980.	-790.	0.	0.	0.	0.		0.	0.	0.	8G
-556	-3080.					••	••	600.	1090.	990.	200.	81
-109	-4720.	- 2 . 2	-1990.	0.	0.	0.	0.					
-6		-3480.	-500.	0.	0.	ŏ.	0.	840.	-7450.	-4970.	-14900.	BK
	-500.	-500.	-200.	0.	0.	0.		4620.	4970.	4620.	-9940.	BM
-596	-4970.	-4970.	-1990.	0.	o.	٥.	0.		0.	0.	0.	AS
-49	-7950.	-9940.	-9940.	0.	0.	0.	0.	-2830.	-1690.	0.	ō.	AW
					••	٠.	0.	0.	٥.	0.	-3680.	BA
-69	-5960.	-4970.	-1490.	٥.	0.		_			-		04
	0.	٥.	0.	ŏ.		0.	٥.	100.	2980.	2190.	450.	D.C
-51	-1390.	-1590.	-250.	0.	0.	٥.	0.	-300.	1690.	1140.	250.	BG
	0.	0.	0.	0.	0.	٥.	0.	2780.	2930.	2040.	3380.	BI
	0.	ō.	ŏ.		٥.	0.	0.	-5960.	-3970.	-5960.		BK
		- •	٠.	0.	۰.	٥.	0.	890.	450.	400.	-14900.	BM
-27	-450.	٥.	0.		_					400.	2680.	BO
-22	-350.	0.	.0.	٥.	٥.	٥.	0.	2880.	400.			
	0.	ō.	0.	0.	0.	0.	0.	2580.	400.	, 0.	0.	AW .
-34	-2680.	-2290.		0.	0.	٥.	0.	2140.	1840.	0.	0.	YA S
-21	0.	0.	-600.	0.	0.	0.	0.	0.	_	550.	0.	2 BA
	••	٧.	٥.	0.	0.	0.	0.	0.	2830.	2240.	500.	BC BC
	0.	_	_			-	••	٠.	2880.	2240.	500.	2 BE
- 39	-2780.		0.	٥.	0.	0.	0.	1790.	_		•	
-5		-2330.	-600.	0.	o.	ö.	0.		0.	0.	0.	2 RG
-91	-1440.	-1640.	-250.	٥.	0.	0.	0.	0.	2430.	2190.	450.	2 81
	٥.	0.	٥.	0.	0.	o.		0.	0.	0.	-24A0.	2 BK
	٥.	٥.	٥.	0.	ŏ.	٥.	0.	1640.	٥.	400.	3330.	2 BM
				-	- •	٧.	0.	550.	350.	350.	0.	4 AO
-10	-450.	0.	0.	٥.	0.	•	_					
_	0.	٥.	0.	ŏ.	0.	0.	0.	-2480.	-1490.	-990.	٠.	4 AQ
-2	-1590.	-1590.	-500.	٥.	0.	0.	٥.	1740.	1640.	450.	ŏ.	4 AW
-1	-600.	-600.	. 0.	0.	-	٥.	0.	٥.	1940.	1490.	350.	
-4	-1340.	-1540.	-250.	0.	0.	0.	٥.	650.	200.	400.	0.	4 BA
		-		٠.	٥.	٥.	0.	1590.	2190.	1540.	50.	4 BE
	0.	٥.	٥.	•	_				_••		20.	4 BI
	0.	0.	0.	٥.	٥.	٥.	0.	0.	0.	-1440.	•	
-4	-3830.	-3830.	-700.	٥.	٥.	٥.	0.	-500.	1040.	1640.	0.	4 BK
	0.	0.		٥.	0.	0.	0.	0.		1940.	0.	4 BH
	ō.	0.	0.	٥.	0.	0.	0.	1690.	1590.		0.	4 BO
	••	٧.	٥.	0.	0.	0.	0.	0.		450.	0.	5 88
	0.	^	_					٠.	٠.	0.	500.	6 AS
-1	-550.	٥.	0.	٥.	0.	٥.	0.	2630.		-		
	-250.	٥.	0.	٥.	0.	ō.	ŏ.	2630.			0.	6 AU
_	-250.	0.	0.	0.	0.	ō.	0.	0.		_	0.	6 AV
-1	-350.	٥.	o.	٥.	0.	o.	0.				0.	A6 AW
	-350.	٥.	0.	۰.	0.	. 0.	0.	4470.	_		0.	6 AX
-3	_2064						٧.	0.	. 0.	0.	0.	A6 AY
	-2980.	-1790.	-400.	0.	٥.	٥.		_				
	-3080	-1490.	-400.	0.	0.	0.	٥.	_		. 0.	. 0.	46 BA
	0.	0.	0.	0.	o.		0.			_	0.	46 BC
	-1690	-1290.	-100.	0.	0.	0.	0.				100	46 BD
	0.	0.	0.	٥.	0.	٥.	0.		_		0.	46 BE
					••	٥.	0.	1940.		·	50	46 BI
, - !	-4570	-4520.	-790.	٥.	^	_					20.	-0 01
•	0	0.	0.	٥.	٥.	0.	0.	. 0.	. 0.	-1540	0	
	0	ů.	٥.		٥.	0.	0.				-2480	46 BK
	0	0.		٥.	٥.	٥.	0.					46 BM
	ō	ŏ.	0. 0.	٥.	0.	0.	0.	·			0	47 AZ
	-	7.	u.	٥.	0.	0.	0.			. 170	0	47 BB

mal. Most of the increased runoff was near the coast because the water table there is near land surface and closely spaced streams give good surface drainage. Also, storm-sewer systems near the coast route storm runoff directly to the surrounding bays. Inland, where streams are fewer and where there is a thick unsaturated zone, runoff and natural evapotranspiration are

minor. In the central part of the island, even storm water quickly infiltrates beyond the reach of plant roots and solar heat, and runoff from buildings and paved areas is disposed of through dry wells and recharge basins; consequently, the irregular frequency of precipitation does not result in increased runoff. Thus, on the basis of observations, the assumed distribution

Table 3.—Net recharge (positive) and withdrawal (negative) at each model node used to simulate manmade historical stresses in western Long Island during the periods 1903-33, 1934-42, 1943-50, and 1951-63. Unstressed nodes are not listed—Continued

		LEVE	L 1			LEVE	L 2			LEVEL 3				
EARS	1903-33	1934-42	1903-50	1951-63	1903-33	1934-42	1943-50	1951-63	1903-33	1934-42	1943-50	1951-63		
ODEL			ES PEH DAY		Cı	UBIC METR	ES PER DA'	٧	Ci	JBIC METRE	S PER DA	٧		
·				8.	0.	0.	0.	0.	٥.	٥.	0.	-2580		
Ø AĦ	. 0. 100.	0。 700。		0.	0.	0.		0.	-200.	-600.	-840.	-2290		
B AV	100.	0.		0.	ō.	0.	0.	0.	-200.	-600.	-750.	-2190		
8 BC	250.	2430.		3280.	0.	9.	0.		-400.	-2480.	-3380.	-5960		
8 BE	150.	1090.		100.	0.	0.	0.	0.	-150.	-1290.	-1690.	-3480		
	_	_	•	•	0.	6.	٥.	0.	-1790.	-8940.	-12420.	-14900		
8 86	_0。			0. 1490.	0.	0.	_		-250.	-1590.	-1390.	-5070		
8 BK	50.	1640。 1740。		1690.	0.	ő.	_ `		-500.	-3480.	-5220.	-11920		
8 8M 8 80	100.				o.	0.	_		-6950.	-3970.	-4970.	-6950		
9 AY	100.			o.	0.	0.	٥.	0.	0.	0.	٥.	0		
								0.	0.	0.	0.	0		
38 64	0.			2330.	٥.				0.	0.	0.	ō		
49 BC	1440.				0.		_		0.	0.	0.	0		
9 84	0.			400.	0.	_	_		-5960.	-2580.	-1990.			
0 AS	-500 .			-2980.	0. 0.	_			0.	0.	0.			
O AU	0.	0,	-500。	-500.	•	•	. •	• • •						
- 4 4 4 4		0.	. 0.	0.	0.	0.	. 0.	0.	-450.		-1390.			
VA O	0. 0.				o.			0.	0.	-400.	-400.			
O BC	0.				0.		. 0.	0.	0.	0.	0.			
50 BE	õ.	_			0.	0.	. 0.		-150.	-1390.	-1840.			
0 BK	100.				0.	0,	. 0.	. 0.	-250.	-1640.	-1440.	-5170		
			_	_		0.	. 0.	. 0.	-500.	-2730.	-3230.	-3970		
0 BH	0.				0. 0.				0.					
1 AW	300.				0.				0.		0.			
1 BC	0.	_			0.				-600.		-1190.	-1640		
0A S	0 a 0 a	_			ō.				-600.		-1090.	-1540		
52 A9	v.	,	•	•••	•									
52 AU	0.	. 0	- 550。	-1590.	0.	, 0.			-150.					
52 AY	-300			-300.	0.				. 0.					
52 BC	550	1140	. 1690.		0.	_			-750.			:		
52 BI	0.				0.	_			0. 0.					
52 BK	0.	890	. 1490.	5960.	0.	, 0			•					
	5040	-3970	3970.	-3970	0.	. 0	. 0.	. 0.	-500.	-2730.				
52 8#	-5960. -300.	-	•		0.		-		0.					
53 BH 53 BJ	-300				ō,			. 0.	0.					
54 AĦ	100				0.	_			_0.					
54 AU	0		-		0 .	. 0	. 0,	. 0.	-150.	-400.	-400	1190		
					_		•	. 0.	-150.	-500	-500	-1490		
54 AU	100		_		0.		-		-150					
54 AY	0	_		-	0,	· <u>:</u>	-		-400					
54 BA	0				0.	-	-	-	-400			-2140		
54 BC	0			-	0.				0.	. 0.	. 0.	7450		
54 BI	0	. •	•	,	•	_	•							
54 B#	. 0	. 0	. 0.	. 0.	0.	. 0	. 0.	. 0.	-1140					
54 BO	-15900				0.	. 0			-5020					
55 AT	-250		250	250.	0.				0,			-		
55 88	550	. 1140	. 1640		0			_	0.		_			
55 BF	-250	2330	250	250.	0	. 0	. 0	. 0.	0.		. •	•		
	_		. 0.	. 7450.	0		. 0	. 0.	0.	. 0.	. 0	•		
55 BH	0	-			ő			. 0.	o.	_	. 0	•		
56 AL	100		-	-	ŏ	-	. 0		0.	. 0.				
56 A∺ 56 AQ	100		. 320		ŏ			. 0.	0		_			
56 AT	-300				0	_	. 0	. 0.	0	. 0	. 0	•		
JU 41		-				_		_	^	. 0	. 0			
56 AZ	0	. 750			0		0		0 -300	-		-		
56 BA	0				0			. 0.	-300					
56 AB		-	-150		0			. O.	0	_				
56 BC			. 0		0	-		0.	ŏ			-199		
56 BE		۱. ا)。 0	. 0.	0		, o V		•	_				

(fig. 35) is defensible, and the simulated response shown in figure 36 provides a better comparison with prototype head decline than the other two cases that were tried. However, figure 36 indicates that a better match to observed water-table decline could have been obtained with a stress distribution intermediate between the one shown in figure 35 and a perfectly

uniform distribution.

The second historical stress was obtained from pumping records that show a large increase in ground-water withdrawals in Kings County between 1899 and 1919. A similar increase occurred in Queens County during the mid 1930's and in Nassau County during World War II and the Korean War. Because of

Table 3.—Net recharge (positive) and withdrawal (negative) at each model node used to simulate manmade historical stresses in western Long Island during the periods 1903-33, 1934-42, 1943-50, and 1951-63. Unstressed nodes are not listed—Continued

LEVEL 1					LEVE	F 5		LEVEL 3					
VEABS	1903-33		1943-50	1951-63	1903-33	1934-42	1943-50	1951-63	1903-33	1934-42	1943-50	1951-63	
HODEL			ES PER DA		С	URIC METH	ES PER DA	Υ	CUBIC METRES PER DAY				
56 BG	0.	0.	+00.	3970.	0.	0.			0.	٥.	-350.	-3380. -650.	
56 BI	0.	0.		990.	0.		_		0. -600.	0. -600.	0. -2780.	-1990.	
56 BO	-9390.	-13060.	-6260.	-1540.	٥.	_		0.	-800.	-500.	0.	0.	
57 BE	٥.	0.		1640.	٥.			_	0.	ō.		٥.	
58 AR	100.	400.	400.	1690.	0.	0.	•	••					
			360	1290.	0.	. 0.	. 0.	0.	-150.	-500.	-500.	-1490.	
58 AY	100.	400.		1290.	0.				0.	0.		-1990.	
58 BA	0.	0. 0.		5510.	ō.			0.	0.			-5020.	
58 BE	0.	0.		1390.	ō.		. 0.	0.	0.	_			
58 BG 58 BI	0.	0.		0.	0.	. 0.	. 0.	. 0.	0.	0.	-400.	-3970.	
30 DI	••	• • •					_	_	_	•	. 0.	-9940.	
58 BK	0.	0.	. 0.	0.	٥.				0.			22-2	
58 RM	0.	0.	-100.		0.	_			0.			_	
58 80	-8490.	-11770.		-1440.	0.	_	_		0.				
59 BI	٥.	٥.			0.	_		•	0.	_		_	
60 AQ	250.	-990.	-990.	-1490.	0.	. 0.		•	•••		- •		
			250	1244	0.	. 0.	. 0.	. 0.	-100-	-400.	-400	-1090.	
60 AY	100.	400.		2 .	0.	_	-		0.		, 0,	-4977.	
60 BA	0.				0.	_	•	-	0.		-500.		
60 BI	0.	-2430.			ō.	•	-	· .	0.	. 0.			
60 BK	-300.				o.		_	. 0.	0.	, 0.	. 0	-2190.	
40 BM	-11920.	-11720	54300	, ,,,,,								-1040	
60 BW	0.	0.		0.	0	. 0			-200				
61 BN	-10980	-11970	-8490		0	. 0			0.				
62 BA	0.		. 0	1640.	0			_	0.	_			
62 BC	0.	. 0.	. 0,	3630.	0				0.	_			
62 BI	0.	. 0.	. 0.	, 0.	0	. 0	. •	. 0.	0.		•		
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62 BW	0.	. 0	0.	. 0.	0	. 0	. 0	. 0.	-200				
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63 BN	-10880				0	. 0	. 0	. 0.	0	_			
64 AQ	0.			. 0.	0	. 0	. 0	. 0.	0	. 0	. 0	650	
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deteriorating water quality, many wells in Kings County were abandoned during the periods 1932–36 and 1940–42. For simulation, changes in pumping were assumed to occur instantaneously at 1903, 1934, 1943, and 1951. The complexity of this model stress (228 pumping areas in model levels 2 and 3, each changing discharge rates at four different times, table

3) cannot be adequately represented on a map. Nevertheless, the complexity of the prototype stress is considerably greater than the model stress.

After being used for cooling, water from many wells was returned to the ground through basins or shallow wells. Before 1961, most sewage in Nassau County was disposed of through cesspools and septic tanks. Water

and the transfer of the state o

Table 3.—Net recharge (positive) and withdrawal (negative) at each model node used to simulate manmade historical stresses in western Long Island during the periods 1903-33, 1934-42, 1943-50, and 1951-63. Unstressed nodes are not listed—Continued

							1.5	VEL 2		FEAET S				LEVEL 3				
			FEAEF			1903-33			-50	1951-63	1903-3	1934-4	1943-50	19	51-63			
EARS	1903-3	1934	-42	943-50	1451-63								TRES PER D					
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OAY		0.	٥.	0.		0	•	0.	0.	0.	•	•	-					
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		0.	٥.	0.				0.	0	. 0		0.	••	0.	-100			
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99 6	•	-		٥	o. o.		0.	0.		0.	0.	0.						

was returned to the ground in the model through 112 recharge areas, whose rates of recharge changed simultaneously with changes in pumping rate. Estimates of recharge are much less precise than estimates of pumping. On the basis of available information, the following assumptions were made: (a) Recharge from cooling water equals 90 percent of water pumped for this purpose; (b) recharge from domestic and commercial water equals 20 percent of water pumped for these purposes in sewered areas; (c) recharge from domestic and commerical water equals 75 percent of water pumped for these purposes in unsewered areas; (d) the remaining water is lost to evaporation or discharged to tidewater and does not return to the ground-water reservoir; and (e) all recharge water goes to the shallow aquifer. Changes in islandwide recharge, pumping, and net stress are given for the period 1903-63 in figure 37.

Pumping and recharge were simulated without

streams. On western Long Island, where most of the pumping was done, the streams were mostly small; many of them had already disappeared by the time a regular stream-gaging program was begun. Thus, the contribution to ground water from diverted streamflow is largely unknown but is probably small. Inclusion of streams in this simulation was considered unnecessary, but ommission of streams adversely affected model accuracy in some areas.

Response to historical pumping and recharge is mapped in figures 38 and 39. Figure 38 and table 4 compare observed head changes with those measured on the model. Figure 38 shows good general agreement between model and prototype head changes, but many details are lost because of the coarse grid of the model. Local defects in simulation also result from the large time steps between changes in pumping rates. The difference between prototype and model drawdown in northwest Queens County (fig. 38) indicates some type

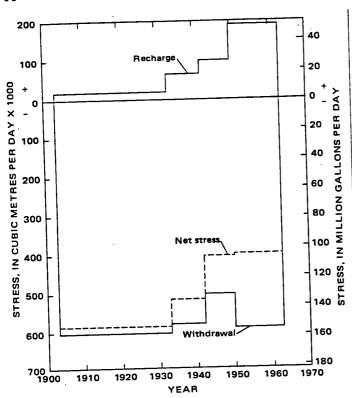


FIGURE 37.—Estimated islandwide changes in pumping, manmade recharge, and net stress between 1903 and 1963. These estimates were used in unsteady-state calibration of the model. They do not include water returned to the same node from which it is pumped.

of model or data deficiency. Comparison of figures 38 and 39 suggests that this deficiency is due to inadequate pumping data. Prototype data for 1961 (fig. 38) shows localized drawdown of 8 m (26 ft) and more in northwest Queens County. This drawdown is not seen in the model data for 1961 but is seen in the model data for 1942 (fig. 39). Apparently, pumping data for 1942-61 are incomplete, probably because drainage pumped from railroad tunnels was not included in pumping data. Model and prototype drawdowns for 1942 cannot be compared because of insufficient prototype data for that year. The author did not attempt to modify the stress to obtain a better comparison between model and prototype drawdowns. Near the north shore (northeastern Queens County, for example) are many localized faults in the simulation, which can be seen in most model tests. These faults result from inability of the coarse model grid to match the fine-scale variations in boundaries. However, icemargin deformation of the sediments along the north shore creates local barriers to ground-water flow that were not modeled.

The general trend of model drawdown in Kings and Queens Counties, where most of the pumping on Long Island was done, matches the overall pattern in pro-

totype drawdown quite well, not only in 1961 (fig. 38) but also at several other times as well. If the differences between the 1903 prototype water table and the steady-state model results in these counties (fig. 29) had been the result of poor model design, one would expect the unsteady-state model response to differ from prototype response by 50-100 percent, as was seen in the steady-state comparison. Averaging prototype drawdowns over areas of several square miles results in better agreement between prototype and model drawdowns than is shown in figure 38. Good comparison of unsteady-state model and prototype response is evidence that the discrepancy in the comparison of steady-state model and prototype response is chiefly the result of pre-1903 pumping, which the steady-state model did not simulate.

In the preceding test, the model was operating in the unsteady-state mode without natural recharge. Model streams were not flowing. The simulation is noticeably inaccurate where it does not account for diverted streamflow. In prototype situations, where wells were close to streams, they received part of their discharge from diverted streamflow. Wells 36, 37, 45, and 47 (table 4; fig. 40) are examples of this type of inaccuracy.

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SUMMARY AND CONCLUSIONS

Problems in water resources evaluation that cannot be analyzed directly can be analyzed through model simulation. The Long Island ground-water reservoir was simulated by a three-dimensional analog model. Experience has shown that ground-water flow in thick, anisotropic aquifer systems such as the system on Long Island cannot be adequately described by two-dimensional methods but can be satisfactorily described by a three-dimensional model.

Boundaries of the Long Island ground-water reservoir are three dimensional, and the resulting natural patterns of ground-water flow are three dimensional. When wells and other human influences affect only the upper surface of the ground-water reservoir, some of the three-dimensional aspects of the natural flow system can be ignored; but the present state of groundwater development on Long Island, which superposes a new three-dimensional flow pattern on the preexisting, three-dimensional, natural flow system, requires three-dimensional analysis. Three-dimensional analysis is not only more difficult than twodimensional analysis; it is less certain because data on hydraulic conductivity normal to the strata are much less abundant than data on hydraulic conductivity parallel to the strata and because compensating errors make evaluation of three-dimensional simulation more uncertain than evaluation of two-dimensional

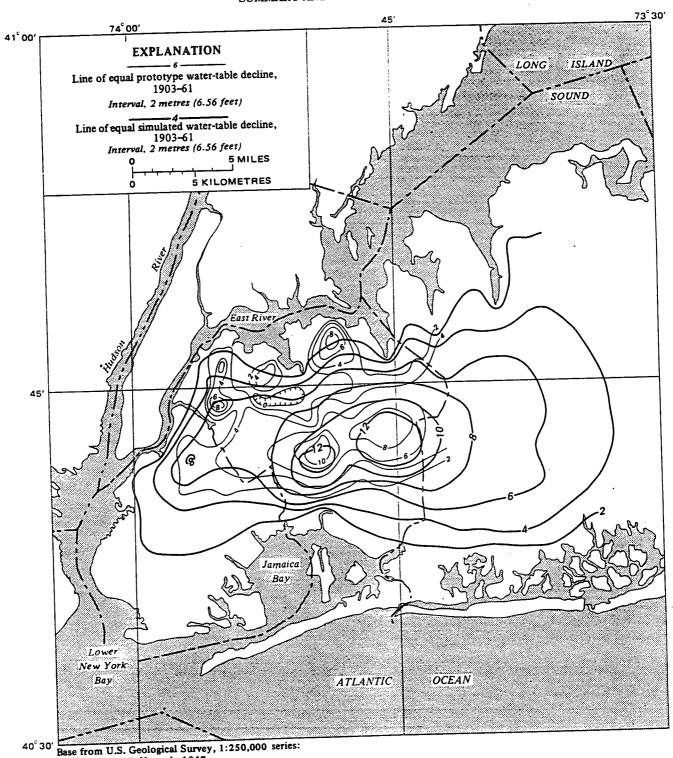


FIGURE 38.—Comparison of simulated decline in water table between 1903 and 1961 on western Long Island with observed decline. (Prototype data modified from Perlmutter and Soren, 1962.)

simulations.

Model-prototype comparisons indicate that this model simulates the Long Island ground-water reservoir adequately, but that care is required in modeling some types of stresses. Good results cannot be obtained | simulate; when the change exceeds 10-15 percent of

when stresses cause significant changes in saturated thickness of the ground-water reservoir. Any change in saturated thickness causes a change in an aquifer's transmissivity that this modeling technique cannot

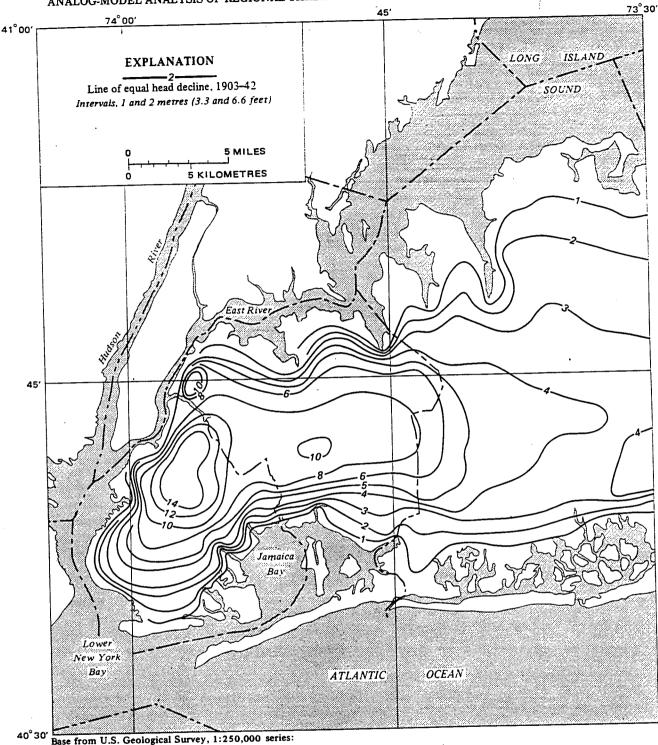
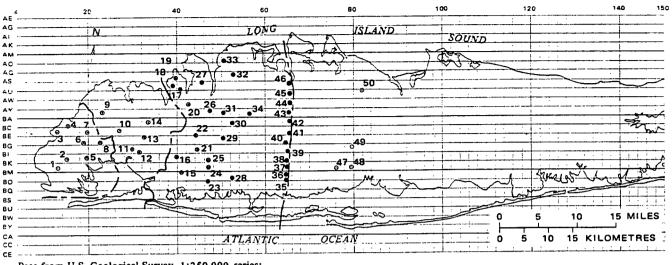


FIGURE 39.—Simulated decline in water table due to pumping on western Long Island between 1903 and 1942.

the total saturated thickness (about 15 m or 50 ft of drawdown for most of Long Island), the error resulting from the divergence of prototype and simulated transmissivity becomes significant. Offshore head measurements in the model are not reliable; boundary conditions there are not well understood. Several dif-

New York, 1957; Newark, 1947

ferent circuits were used to simulate stream-aquifer relationships, but because these circuits were developed empirically, not on the basis of open-channel flow equations, the usefulness of each type of stream circuit is limited to a few stress situations. Extremely localized stresses near the mouths of streams can give



Base from U.S. Geological Survey, 1:250,000 series: Hartford, 1962; New York, 1957; Newark, 1947

EXPLANATION

₀10 Location of well 10

FIGURE 40.—Locations of wells used for water-level changes in table 4.

Table 4.—Comparison of model and prototype water-level changes for selected wells between 1951 and 1963

Well ¹	Prototype change (m)	Model change	Well	Prototype change (m)	Model change (m)
1	²0.20	1.7	26	-2.0	-1.8 to -2.4
2		4.4	27	10	.10 to40
3		0 to 31.0	28	.0	0 to .80
4		4.0	29	20	-1.2
5		2.0 to 3.0	30	-1.0	60
6		4.8 to 5.8	31	-1.0	-1.8
7		4.0 to 5.0	32	.0	50 to .60
8		1.2 to 2.0	33	30	0 to40
9		.80 to 1.0	34	60	0 to20
10		.10 to60	35	.03	1.0 to 1.8
11		0 to60	36		1.0 to 1.8
12		60 to80	37	.30	.80 to 1.2
13		-1.8 to -3.0	38	.40	.80
14		-1.4 to -2.4	39	.30	.40 to .50
15		-1.4 to -1.6	40	.0	.20 to .40
		-2.2 to -2.6	41	.40	0 to .40
16		24	42	.30	.20
		0 to24	43	.40	.20 to .30
18		0 to18	44	.30	.20 to .30
19		-1.0	45		20 20
20		-2.4 to -2.6	46		0 to .02
21 22		-2.4 10 -2.6	47		.22 to .26
22		-1.2	48		.14 to .16
	•:	-1.2	49		.12 to .14
24		-1.4 to -2.0	50		.04
25	1.2	-1.4 10 -2.0	"		.04

Well locations shown in figure 40.

Positive changes indicate increasing water levels between 1951 and 1963; negative changes indicate decreasing water levels.

Range of values indicates that prototype well lies between two model nodes having

a distorted picture of stream discharge with almost any stream circuit.

The apparent inability of the steady-state model to match the 1903 water table in western Queens County is shown (by good unsteady performance in that area) to result from pumping interference in 1903, not from incorrect conductivities or boundaries in the model. This model, however, cannot simulate the fine structure of the hydrologic features in the north shore area; predictive results near the north shore may not be satisfactory.

The desired end product of model design, construc-

tion, and calibration is predictive capability. The ultimate purpose of the model is to predict response of the ground-water flow system to future stresses. Three types of stresses are considered: (a) Natural stresses, such as prolonged drought; (b) stresses caused by human activity, which are unforeseen or unplanned, including changes in recharge rate that result from paving and other construction activities such as dams, quarries, landfills, and recharge basins; and (c) planned water-management schemes. Examples of water-management alternatives are discussed briefly by Cohen, Franke, and Foxworthy (1968, p. 94-105); two plans are discussed exhaustively in Greeley and Hansen (1971) and Holzmacher, McLendon, and Murrell (1968). Several examples of each type of stress have been modeled. Results of these model tests and a description of the hydrologic and electrical assumptions underlying the tests are contained in other reports.

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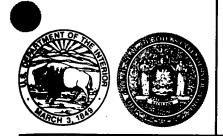
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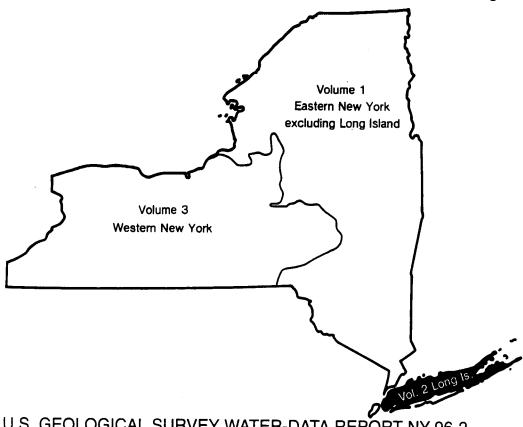
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Water Resources Data New York Water Year 1996

Volume 2. Long Island

by A.G. Spinello, R. Busciolano, R.B. Winowitch, and V.K. Eagen



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT NY-96-2 Prepared in cooperation with the State of New York and with other agencies

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Remark Codes

The following remark codes may appear with the water-quality data in this report:

PRINTED OUTPUT	REMARK
E	Estimated value
>	Actual value is known to be greater than the value shown
< .	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)

Dissolved Trace-Element Concentrations

Note.—Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (µg/L) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's and 100's of nanograms per liter (ng/L). Data above the µg/L level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994.

Records of Ground-Water Levels

Although over 950 wells are measured at annual or more frequent intervals, only ground-water level data from a basic network of 679 observation wells are published herein. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers.

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude and (2) a local number that is provided for local needs. See figure 1.

Data Collection and Computation

Measurements are made in many types of wells, under varying conditions of access and at different temperatures, hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Water-level measurements in this report are given in feet in reference to sea level. National Geodetic Vertical Datum of 1929 is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum in reference to National Geodetic Vertical Datum of 1929 is given in each well description. Water levels in wells equipped with recording gages are reported as mean daily values, and the extremes are instantaneous values selected from the digital record. Water levels in wells not equipped with recording gages are read periodically or measured periodically with a weighted tape by U.S. Geological Survey personnel and (or) an observer.

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths

to water the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given to a tenth of a foot.

Data Presentation

Most well records consist of three parts, the station description, the data table of water levels observed during the current water year, and a graph of the water levels for the current water year or other selected period. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings of the well description.

LOCATION.—This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds), a landline location designation, the hydrologic unit number, the distance and direction from a geographic point of reference, and the owner's name.

AQUIFER.—This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.—This entry describes the well in terms of depth, diameter, casing depth and (or) screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other changes since construction.

INSTRUMENTATION.—This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on weekly, monthly, or some other frequency of measurement.

DATUM.—This entry describes both the measuring point and the land-surface elevation at the well. The measuring point is described physically (such as top of collar, notch in top of casing, plug in pump base and so on), and in relation to land surface (such as 1.3 ft above land-surface datum). The elevation of the land-surface datum is described in feet above (or below) sea level, it is reported with a precision depending on the method of determination.

REMARKS.—This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-survey) observers.

PERIOD OF RECORD.—This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.—This entry contains the highest and lowest water levels of the period of record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet above (or below) sea level and all taped measurements of water level are listed. For wells equipped with recorders, only abbreviated tables are published, generally, only water-level means are listed for every fifth day and at the end of the month (eom). The highest and lowest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level.

A hydrograph of water levels follows the data table for some wells. The current year and the previous 9 years of record are plotted in feet above (or below) sea level. If the period of record is less than 10 years, the water levels for the entire record are plotted.

A hydrograph of water levels follows the data table for some wells. The current year and the previous 9 years of record are plotted in feet above (or below) sea level. If the period of record is less than 10 years, the water levels for the entire record are plotted.

Records of Ground-Water Quality

Records of ground-water quality in this report differ from other types of records in that for most sampling sites they consist of only one set of measurements for the water year. The quality of ground water ordinarily changes only slowly; therefore, for most general purposes one annual sampling, or only a few samples taken at infrequent intervals during the year, is sufficient. Frequent measurement of the same constituents is not necessary unless one is concerned with a particular problem, such as monitoring for trends in nitrate concentration. In the special cases where the quality of ground water may change more rapidly, more frequent measurements are made to identify the nature of the change.

Data Collection and Computation

The records of ground-water quality in this report were obtained mostly as part of a special study. As a result, the records for this year, by themselves, do not provide a balanced view of Long Island ground-water quality.

Most methods for collecting and analyzing water samples are described in the "U.S. Geological Survey TWRI publications referred to in the "On-site Measurements and Sample Collection" and the "Laboratory Measurements" sections in this data report. In addition, the TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected unstable constituents. The values reported in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Data Presentation

The records of ground-water quality are published in a section titled QUALITY OF GROUND WATER immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by County, and are identified by well number. The prime identification number for wells sampled is the 15-digit number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the well number, date of sampling, and other pertinent data are given in the table containing the chemical analyses of the ground water. The REMARK codes listed for surface-water-quality records are also applicable to ground-water-quality records.

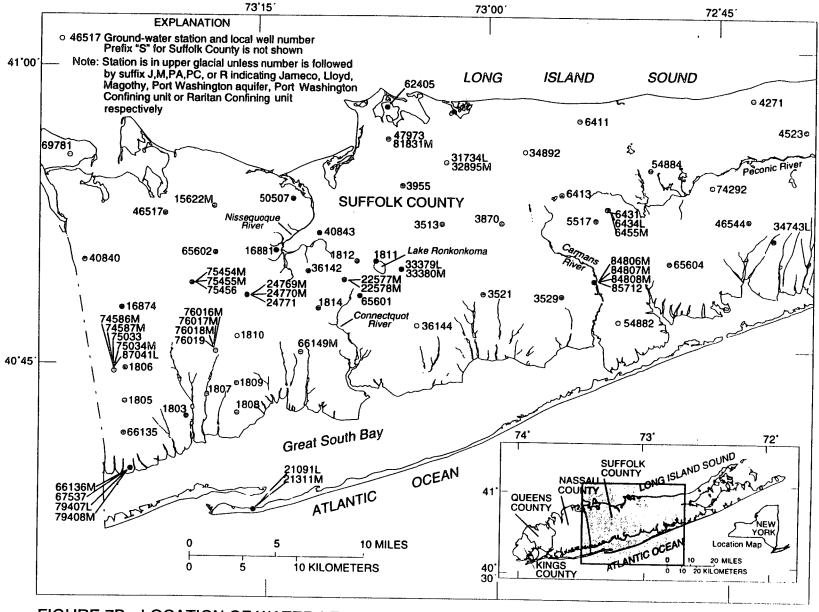


FIGURE 7B.--LOCATION OF WATER-LEVEL DATA COLLECTION STATIONS

405343073055004. Local number, S3955.4

LOCATION.—Lat 40°53′43″, long 73°05′50″, Hydrologic Unit 02030201, at west side of Mark Tree Road, south of Pond Path, Setauket. Owner: United States Geological Survey.

AQUIFER.—Upper glacial (water table).

WELL CHARACTERISTICS.—Augered PVC observation well, diameter 2 in., depth 80 ft, screened 76 to 80 ft.

INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

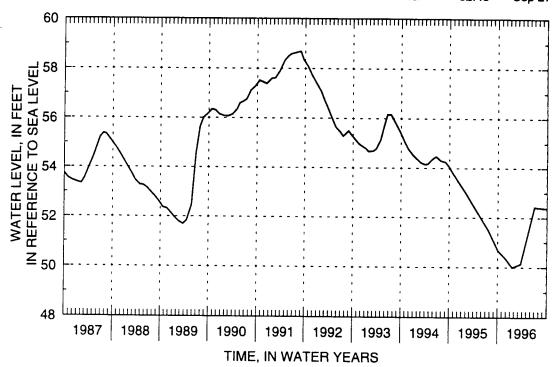
DATUM.—Land-surface datum is 123.0 ft above sea level. Measuring point: Top of 2-in PVC coupling, 0.24 ft below land-surface datum. REMARKS.—Replaced well S3955.3 in April 1975 at same location. Unpublished records from September 1944 to September 1975 are available in files of the Long Island Subdistrict Office.

PERIOD OF RECORD.—April 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 60.23 ft above sea level, June 21, 1979; lowest measured, 50.00 ft above sea level, January 18, 1996.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	
Oct 3	50.67	Nov 28	50.36	Jan 18	50.00	Mar 21	50.14	Jul 1	52.43	Sep 27	52.38	



405013073263601. Local number, S40840.1

LOCATION.—Lat 40°50′13″, long 73°26′36″, Hydrologic Unit 02030201, at intersection of Cold Spring Hill Road, Ledgewood Drive, and West Rogues Path, on grass island, Huntington. Owner: Town of Huntington.

AQUIFER.—Upper glacial (water table).

WELL CHARACTERISTICS.—Augered PVC observation well, diameter 2 in., depth 79 ft, screened 77 to 79 ft.

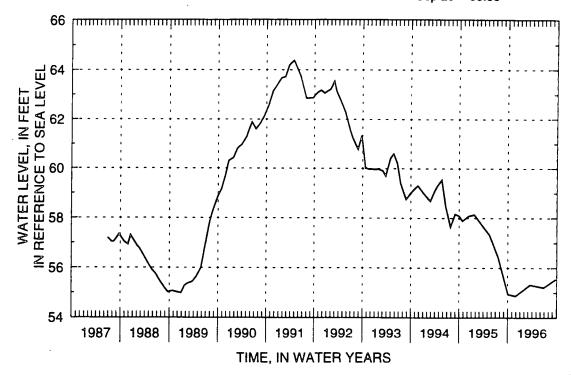
INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

DATUM.—Land-surface datum is 131.5 ft above sea level. Measuring point: Top of 2-in PVC coupling, 0.03 ft below land-surface datum. PERIOD OF RECORD.—August 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 67.02 ft above sea level, December 10, 1984; lowest measured, 54.87 ft above sea level, November 28, 1995.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	
Oct 3	54.95	Nov 28	54.87	Mar 18	55.32	Jun 27	55.21	Sep 25	55.55			



405124073111501. Local number, S40843.1

LOCATION.—Lat 40°51′24″, long 73°11′15″, Hydrologic Unit 02030201, at intersection of Nissequogue River Road and North Country Road (State Route 25A), just north of Middle Country Road (State Route 25), on grass island, Smithtown. Owner: Town of Smithtown. AQUIFER.—Upper glacial (water table).

WELL CHARACTERISTICS.—Augered steel observation well, diameter 2 in., depth 44 ft, screened 41 to 44 ft.

INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

DATUM.—Land-surface datum is 66.0 ft above sea level. Measuring point: Top of 2-in PVC coupling, 0.01 ft below land-surface datum. PERIOD OF RECORD.—July 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 37.93 ft above sea level, March 27, 1979; lowest measured, 33.84 ft above sea level, July 9, 1971.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	
Oct 3	34.13	Nov 28	34.76	Jan 18	34.24	Mar 22	35.23	Jul 1	35.52	Sep 25	35.17	



405604073064301. Local number, \$47973.1

LOCATION.—Lat 40°56′04″, long 73°06′43″, Hydrologic Unit 02030201, at north side of State Route 25A, 189 ft west of Ridgeway Avenue, Setauket. Owner: Suffolk County Department of Health Services.

AQUIFER.—Upper glacial (water table).

WELL CHARACTERISTICS.—Drilled steel observation well, diameter 6 in., depth 90 ft, screened 78 to 88 ft.

INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

DATUM.—Land-surface datum is 94.0 ft above sea level. Measuring point: Top of 6-in steel flange, 2.43 ft below land-surface datum. PERIOD OF RECORD.—January 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 28.14 ft above sea level, April 26, 1991; lowest measured, 20.83 ft above sea level, March 5, 1980.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date .	Water level	Date	Water level
Oct 3	22.82	Nov 28	22.92	Jan 18	22.63	Jul 1	25.14	Sep 27	24.49	Duic	icvei

410243071560101. Local number, S48519.1

LOCATION.—Lat 41°02′42″, long 71°56′05″, Hydrologic Unit 02030202, at southwest corner of South Fairview Avenue and South Federal Street, Montauk. Owner: Suffolk County Department of Health Services.

AQUIFER.—Upper glacial (water table).

level

Date

Date

WELL CHARACTERISTICS.—Drilled steel observation well, diameter 6 in., depth 82 ft, screened 68 to 78 ft.

INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

Date

Water

level

DATUM.—Land-surface datum is 63.5 ft above sea level. Measuring point: Top of 6-in steel flange, 1.68 ft below land-surface datum.

PERIOD OF RECORD.—January 1974 to current year. Unpublished records from January 1974 to September 1983 are available in files of

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 4.59 ft above sea level, March 15, 1983; lowest measured, 2.07 ft above sea level, December 22, 1976.

Water

level

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date

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level

Date

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Water

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Dec 7	3.04	Mar 1	19 3.43	Jul	9 3.	.27	Sep 26	3.61			Julio
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	2.0	1987	1988	1989	1990	1991	1992	1003	1004		
				.550		i 1991 E, IN WA	•	1993 ARS	1994	1995	1996

410149071583201. Local number, S48577.1

LOCATION.—Lat 41°01′49″, long 71°58′32″, Hydrologic Unit 02030202, at north side of Montauk Point State Parkway (State Route 27), 19 ft east of entrance to East Hampton Disposal and Recycling Center, Montauk. Owner: Suffolk County Department of Health Services.

AQUIFER.—Upper glacial (water table).

WELL CHARACTERISTICS.—Drilled steel observation well, diameter 6 in., depth 189 ft, screened 173 to 183 ft.

INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

DATUM.—Land-surface datum is 168.1 ft above sea level. Measuring point: Top of 6-in steel flange, 1.61 ft below land-surface datum. PERIOD OF RECORD.—January 1974 to current year. Unpublished records from January 1974 to September 1983 are available in files of

the Long Island Subdistrict Office.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 4.50 ft above sea level, September 18, 1979; lowest measured, 0.54 ft below sea level, May 5, 1981.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	
Mar 14	3.93											

410316071535501. Local number, S48579.1

LOCATION.—Lat 41°33′16″, long 71°53′54″, Hydrologic Unit 02030202, at north side of Montauk Point State Parkway (State Route 27), adjacent to intersection with Old Montauk Highway, Montauk. Owner: Suffolk County Department of Health Services.

AQUIFER.—Upper glacial (water table).

WELL CHARACTERISTICS.—Drilled steel observation well, diameter 6 in., depth 66 ft, screened 53 to 56 ft.

INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

DATUM.—Land-surface datum is 38.6 ft above sea level. Measuring point: Top of 6-in steel flange, 1.55 ft below land-surface datum.

PERIOD OF RECORD.—January 1974 to current year. Unpublished records from January 1974 to September 1983 are available in files of the Long Island Subdistrict Office.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 4.18 ft above sea level, June 5, 1984; lowest measured, 2.46 ft above sea level, December 22, 1976.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water levei	Date	Water level
Dec 7	3.18	Jan 30	3.16	Mar 14	3.73	Jul 9	3.65	Sep 26	4.05		

LOCATION.—Lat 40°53′09″, long 73°12′54″, Hydrologic Unit 02030201, at east side of Landing Avenue, 1.5 mi north of Spruce Street, San Remo. Owner: United States Geological Survey.

AQUIFER.—Upper glacial (water table).

WELL CHARACTERISTICS.—Drilled PVC observation well, diameter 2 in., depth 80 ft, screened 76 to 80 ft.

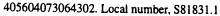
INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

DATUM.—Land-surface datum is 90.3 ft above sea level. Measuring point: Top of 2-in PVC coupling, 0.01 ft above land-surface datum. PERIOD OF RECORD.—December 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 46.23 ft above sea level, September 19, 1984; lowest measured, 41.51 ft above sea level, December 14, 1981.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct 3	41.96	Nov 28	41.72	Mar 19	42.11	Jul 1	43.62	Sep 25	43.90		



LOCATION.—Lat 40°56′04″, long 73°06′43″, Hydrologic Unit 02030201, at north side of North Country Road (State Route 25A), 199 ft west of Ridgeway Avenue, East Setauket. Owner: Suffolk County Department of Environmental Conservation.

AQUIFER.—Magothy (confined).

WELL CHARACTERISTICS.—Drilled PVC observation well, diameter 4 in., depth 470 ft, screened 462 to 467 ft.

INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

DATUM.—Land-surface datum is 94.0 ft above sea level. Measuring point: Top of 4-in PVC coupling, 0.96 ft below land-surface datum. PERIOD OF RECORD.—March 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 24.03 ft above sea level, February 13, 1991; lowest measured, 18.73 ft above sea level, October 3, 1995.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct 3	18.73	Nov 28	19.41	Mar 21	20.06	Jul 1	20.50	Sep 27	20.29		

405536072375301. Local number, \$82938.1

LOCATION.—Lat 40°55′36″, long 72°37′53″, Hydrologic Unit 02030202, at Indian Island County Park, north side of main entrance road, 107 ft east of rest room facilities, Riverhead. Owner: Suffolk County Department of Health Services.

AQUIFER.—Lloyd (confined).

WELL CHARACTERISTICS.—Drilled steel observation well, diameter 2 in., depth 1,022 ft, screened 1,010 to 1,022 ft.

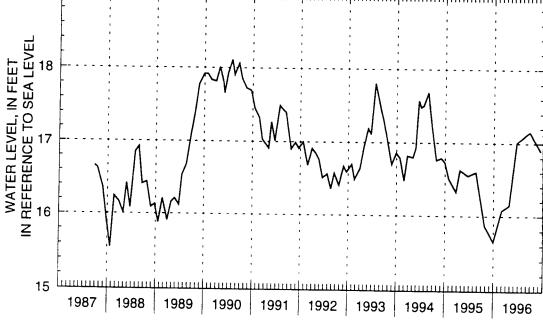
INSTRUMENTATION.—Measurement with chalked tape by U.S. Geological Survey personnel.

DATUM.—Land-surface datum is 21.0 ft above sea level. Measuring point: Top of 2-in steel coupling, 0.14 ft below land-surface datum. PERIOD OF RECORD.—June 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.—Highest water level measured, 18.11 ft above sea level, April 27, 1990; lowest measured, 15.55 ft above sea level, October 23, 1987.

WATER LEVEL, IN FEET IN REFERENCE TO SEA LEVEL, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

Date	Water level	Date	Water ievel	Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov 30	16.08	Jan 25	16.15	Mar 21	17.01	Jun 25	17.15	Sep 16	16.89		
	الم 19	mmmi	mmmm	ուսորուս	սակատ	mpmana	uluuuu	սիսուսու	mmmin	ппппппп	
		:	1		;	1	1	1 1		1	
į			1		1	1	•		•	-	
. ⊢i	ш́ 18 ├-		!	' <i>M</i>	A	:			i	1	



TIME, IN WATER YEARS

THIS PAGE LEFT INTENTIONALLY BLANK

REFERENCE NO. 9

REGION II SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM

PROJECT NOTE

TO:

Smithtown Ground Water Contamination file

DATE:

14 September 1998

FROM:

Dennis J. Foerter, CHMM

SUBJECT:

Location and Latitude/Longitude of Smithtown Ground Water Contamination site

The complete lateral and vertical extent of the contaminated groundwater plume at the Smithtown Ground Water Contamination site is unknown; therefore, the location of the plume is defined as the portion of the Upper Glacial/Magothy aquifer defined by wells contaminated with Level I concentrations of PCE. Figure 3 of this report delineates Level I contaminated residential wells. Based on this information, a site landmark (within the defined plume) was selected on a U.S.G.S. topographic map. This location is the intersection of Moriches Road and Fifty Acre Road. A review of the U.S.G.S. topographic map (i.e., St. James, N.Y. Quadrangle) indicates that the latitude and longitude of this intersection is:

Latitude:

40° 53' 16.1" N

Longitude:

73° 10' 29.2" W

Attached to this project note is the U.S.G.S. topographic map for St. James, N.Y. and a calculation sheet for the latitude and longitude of the Moriches Road/Fifty Acre Road intersection.



SHEET	ı	of	1

CLIENT/SUBJECT Smithto.	UN GRUNDWATE	ER CONTAMINATION	U W.O. NO
TASK DESCRIPTION LATIT	UDE/LongituDE	(asculation	TASK NO
PREPARED BY	DEPT	DATE	APPROVED BY
MATH CHECK BY	DEPT	DATE	
METHOD REV. BY	DEPT	DATE	DEPTDATE
The location of the cent	er of the plume	was plotted on t	the Saint James, NY
(7.5 minute series) to			
spans 2.5' or 150"			
· · · · · · · · · · · · · · · · · · ·	1 1 1 1 1		and 40°55'N latitude
and 73°10' and 73°17	2 30 longitude		
The latitude was calc	wated as foilo	ws:	
			4
	y = 40°52'30"	N + [(\frac{\gamma_1}{\gamma_k}) \times 150	
where:			
		pobodiativic wat	
		Her of the plum	
		topographic may	p, between
-0 52 S	o" and 40°55	1.3	
Thus:		T/E 052	, ,
	y = 40°52'30	"N + \(\left(\frac{5.95cm}{19.35cn} \)	n) * 150"
	= 40°52°30	1" N + 46.1"	۱۱ "۱، ما '53 40° ⇔
T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		,	
The longitude was cal			7
	x = 73°10'W	+ \(\left(\frac{\times_1}{\times_2}\right) \times 150	n
where:			T .
x, = distance	, measured from	n topographic r	nap, from longitude
73°10′ v	v to the cente	r of the plume.	
		m tupographic r	nap, between
73°10′	and 73°12'2	10" M	
47		_	
Thus:	x = 73°10'W	+ \(\begin{array}{c} \(2.85 \text{cm}\\ 14.65 \text{cm}\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\)× 150"
			1 -
	= 73°10' W	+ 29.2"	→ 73° 10′ 29.2" W
RFW 10-05-003/A-5/85			

512-5643

the National or State reservations shown on this map

REFERENCE NO. 10

SMITHTOWN GROUNDWATER CONTAMINATION SMITHTOWN, NEW YORK

TDD NO.: 02-98-01-0001

TAP WATER SAMPLING LOG

APRIL 3-17, 1998

DOCUMENT CONTROL NO.: 02-266

REGION II
SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM
ROY F. WESTON, INC.
FEDERAL PROGRAMS DIVISION
EDISON, NEW JERSEY 08837

Resident Name:	Collins Diame	
Address:	45 Farm Road	
	St. JAMES, NY 11780	
Mailing Address:	SAme	
Treatment Type (if ap	oplicable): Mucromet (1000 Removal) NOT operation	u l
Location of Treatment	System: Basement	
Sample No.	SGC-9804- TWOOL	
Sample Date/Time:	4/3/AP 1415	
Sample Collected From	m: Kitchen TAD	
Comments:	INSPECT Treatment, NO BY POS) - NOT CUTIENTLY SAPRATIONAL	_
1402 TUIM	on water at Kitchen Tul	
1415 (, 14	etha corlects sample sec-agou-twoi	
	GP)	
Population: S		
T	000001 Database Entry:	

Resident Name:	Rosental, Gary
Address:	98 39 Fam Loud
	St. Janes James (1780
Mailing Address:	Same
Treatment Type (if ap	plicable): Mirmet (in Kenoval) Particulate
Location of Treatment	System: Bajen end
Sample No.	SGC-9804- TWOZ
Sample Date/Time:	4/3/98/1440
Sample Collected Fron	1: Kitchen Tal
Comments:	1425 Inspect Treatment, Treatment, MICTOMET
fulter with saw	f. Her
1430 Bagin	Lunny Kitchas sink
•	
1440 collec	+ southe Two
Population 2	\mathcal{G}
1	000002 Database Entry:

Resident Name:	MARX, Donald & Gloria
Address:	32 FARM ADUD
Mailing Address:	St. & James 11780
Treatment Type (if ap	
	SGC-9804- Tw 03
Sample Date/Time:	-1/3/48 / 150D
Sample Collected From	n: Bathroom Tup / wild not remove kitches Agastor
Comments:	Tweet Kitchen Tap. Con It not a province off will Tube from hathoom
1448 Rue B	atknown such. Mrs. MARY whomen up she was
wishing dish	e, priet to START coming
1500 s Koth	coilects surle SGC-9704-TB03
Population -	
•	000003 Database Entry:

Resident Name:	Svatek	
Address:	9 FARN Fro.	
	St James, my 17780	
Mailing Address:	Same	
Treatment Type (if ap	opticable): None	
Location of Treatment	t System: NA	
Sample No.	SGC-9804- Two 4	
Sample Date/Time:	4/3/88//6/0	
Sample Collected From	m: Outside shipport ourse manted sample collected from ships	ut.
Comments:		
16100 RUN	outside spigot at highest Rute	
1610 S. Keth	(A collects small scc-9864-Thoy	
	\sim	
Population.	4	
,	000004 Database Entry:	

Resident Name:	ANDERSEN, WINTHOP
Address:	River Lard
Mailing Address:	P.O. Box 491 Smithtonn, NY 11787
Treatment Type (if ap	
Location of Treatment	System: Nove
Sample No.	SGC-9804- TWD5
Sample Date/Time:	4/3/48/1645
Sample Collected Fron	n: Kitchen TAP
Comments:	
1635 Bea	in Rinning TAS
1645 S. Fe	the collect soc-apor-tuos
Once Sny	s he's been many the nater throughout
The day	(
Population 1	
1	000005 Database Entry:

Resident Name:	HANGEN, Robert
Address:	17 FARIN RO
Mailing Address:	St. James, My 11780 Same
Treatment Type (if applie	cable): Love
Location of Treatment Sy	rstem: $\sqrt{4}$
Sample No. SG	GC-9804- TWO6
Sample Date/Time:	4/3/97/1710
	Kitchen TAS
Comments:	JO TReatment system within Horsehold
1558 R-N	Kitchen TAD
1710 S. Keth	4 Collects Sample 56c-9804-TWOB
Mu. Hanso	I suis that they will be moving soon
Population: 7	

Resident Name:	Swanson, Robert 2	Dona
Address:	46 HArbor HIM RD	
Mailing Address:	Sane	
Treatment Type (if ap	oplicable): None System: NA	
Location of Treatment	: System: N/A	
Sample No.	SGC-9804- TWO7	
Sample Date/Time:	4/3/9 1810	
Sample Collected From	n: Kitchen Tap	
Comments:		
1800 Start	Running nate from Tal	
ilio - collec	+ sumple SGC-TWD7	
Paradation 2	(4:u simme)	
v	000007	Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Milani, Robert	·.
Address:	54. James NY 11780	
Mailing Address:	SAme	
	plicable): Paticulate	
Location of Treatment	•	
	SGC-9804- TWDP	
	4/3/47 1830	
Sample Collected Fron	n: Kitchen TAP	
Comments:	·.	
	<u> </u>	· · · · · · · · · · · · · · · · · · ·
Valo uas cl	ned to Aypail treatment.	
_ lite Kita	hen tall run	·.
1830 /asple	,	
	s to other than to be treatment	
VAIVO REDIFICA	s of the first to be full to	
Population 2	201	

000008

Resident Name:	Ugo Saugnai	
Address:	Ugo Squanci 26 Fin Oak Ln. Head of Harbor	
. 1001 055.	11. / 1' 11. 1	
	1stac of 14x pos	
Mailing Address:		
Treatment Type (if ap	plicable): Sediment + Kust Filter Curticopy System: 1545 Einst near well tank	£ 4
Location of Treatment	System: 545 timent near well tank	
Sample No.	SGC-9804- TWO9 13:05	
Sample Date/Time:	4/4/98	
	n: Kitchen Sink	
Comments:	· · · · · · · · · · · · · · · · · · ·	
12 16h.	2 po-12 treatment 1,26 /2/1855	
D = 1 1 4	(DT)	
Population 4		

Deplicate

SMITHTOWN GROUNDWATER CONTAMINATION

Resident Name:	Sharon Hawking 1 W. Herill
Address:	1 W. 46evill
Mailing Address:	
Treatment Type (if a	oplicable): Rone
Location of Treatmen	t System:
Sample No.	SGC-9804- +W10 Dup TW11
Sample Date/Time:	4/4/98 /3/25
Sample Collected Fro	4/4/98 13:25 m: Kitolian Sink
Comments:	
Pepul ihon:	3

RESIDENTIAL SAMPLE LOG

Resident Name: C	narles Sc	chinicl			· .
Address:	179	Moriches		584-	7760
Mailing Address:					
Treatment Type (if a Location of Treatmer		Mrse Mm		····	
Sample No.	SGC-9804-	TW12	132	-15	
Sample Date/Time:	4/4/98				
Sample Collected Fro	om:	-clause			
Comments:					<u> </u>
					
	The state of the s				
				6	
Population.	· 				

000011

Resident Name: _	Smith
Address:	5 Watercrest
Mailing Address: _	Sume
Treatment Type (if app	System: Nosement (2 cartridge)
Location of Treatment	System: Dusement
Sample No.	GC-9804- TW13
Sample Date/Time: _	4/4/98 14.30 Hitchen Sunk
Sample Collected From	: Kitchen Stark
Comments: _	Summitted by SCDHS 2/4/98
Per =	<i>(</i> 少つ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・
T 5/2-1	1-off (looped out) for sample.
Population:	

Resident Name:	Riegger
Address:	Riegger 14 Waterrest
Mailing Address:	
Treatment Type (if a	applicable): 1000 tsediment nt System: near well tank (near Kitchen)
	SGC-9804- Tw14
Sample Date/Time:	4/4/98 /4:45 om: Kitchen Sink
Sample Collected Fro	om: Kitchen Smit
Comments:	
	<i>\$€</i> }
Population: 5	
	· · · · · · · · · · · · · · · · · · ·

Resident Name:	Natale.	_
Address:	5 Fells Way	<u>.</u>
Mailing Address:		_
Treatment Type (if a	pplicable): Colling an water Softone It System: Boseman +	_
Location of Treatmen	t System: Baseman f	
Sample No.	SGC-9804- TW15	_
Sample Date/Time:	m: outside favert	_
Sample Collected Fro	m: outside favert	_
Comments:		
outside fau	cet does not run through Cullinger	· -
	(MS/MSD	_ ノ
Population 2		

Resident Name:	Edwards
Address:	25 Harbor Rd (Primary House)
Mailing Address:	P.O. Box 385 St James 11780
Treatment Type (if ap	oplicable): Vone
Location of Treatment	System:
Sample No.	SGC-9804- TW/6
Sample Date/Time:	4/4/98 15:30
Sample Collected From	m: Kithen Sink
Comments:	
Population: 4	€ Contract of the contract of
Ţ	000015 Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Musumeci de Edwards
Address:	25 Harbor Rd
	(Rental home)
Mailing Address:	P.O. By 385
	>t. James NY 11780
Treatment Type (if a	pplicable): <u>Carbon</u>
Location of Treatmer	
Sample No.	SGC-9804- TWI 7
Sample Date/Time:	4/4/98 15:45
Sample Collected Fro	m: fourt in basement > pre: filter
Comments:	
Population. 2	
ŗ	000016 Database Entry:

Resident Name:	Shady
Address:	12 Farm Road
Mailing Address:	P.C. Box 533
·	East Satacket NY 11733
Treatment Type (if ap	plicable): Micvomet & Sediment
Location of Treatment	System: bosement
Sample No.	SGC-9804- TwiE
Sample Date/Time:	4/4/98 1700
Sample Collected From	n: Kitchen tap
Comments:	
Sed mont	filter bypassed (volve cut-of)
Population 2	
1	000017 Database Entry:

Resident Name:	DeMato
Address:	36 Har ber Kel
Mailing Address:	PO Box 2118
Treatment Type (if ap	plicable): Sediment 20 M
Location of Treatment	System: hasenest
Sample No.	SGC-9804- TW19
Sample Date/Time:	4/4/98 1810 1: Kitchen Sink
Sample Collected Fron	1: Kitchen Sink
Comments:	
11 - 12 - 12 - 12 - 12 - 12 - 12 - 12 -	
Population 3	

Deplicate.

SMITHTOWN GROUNDWATER CONTAMINATION

Resident Name:	Burke	
Address:	44A Woodevest & Dr	
Mailing Address:		
Freatment Type (if ap	1	r ick
Location of Treatmen	t System: Dusement	
Sample No.	SGC-9804-7W20 TW21	
Sample Collected From	m: Kitchen - good +	
Comments:		
Sed ment	filter bypossed (Havelous)	
for som	/ le	
<u> </u>		
Population:		
- 1		

Resident Name:	Lee Tg. N	٠.
Address:	2.A Morches Ro	
	St. Janey	
Mailing Address:	Sane	
	oplicable): None (no files	
Treatment Type (if ap	oplicable): \(\sum_{\lambda} \tag{\lambda}	
Location of Treatment	t System:	
Sample No.	SGC-9804- TW27	
Sample Date/Time:	u/r/a8 / 1230	
Sample Collected From	n: Kitchen Tax	
Comments:		
_ well in	bock jard	
Population: 2		
V		

Resident Name:	Rema Thomas
Address:	
Mailing Address:	P.O. Box 285 17 University Dr. Setauket, NY 11733
Treatment Type (if applic	able): Missuet (100/portulate)
Location of Treatment Sys	stem: Basement
Sample No. SG	C-9804- Tw23
Sample Date/Time:	1/5/18 / 1300
Sample Collected From:	Basement TAD (at oner's regrest)
Comments:	Raitmont Testem uns Bypassed by
closing values	to treatment.
Population 6	

RESIDENTIAL SAMPLE LOG

Resident Name:	PAINZ, MIXE & Devise	
Address:	+4 Branglebrux Ro	
	St. James my 11788	-
Mailing Address:	Same	- .
		- ·
Treatment Type (if ap	oplicable): Mccomet	_
Location of Treatment	System: Kuement	
Sample No.	SGC-9804- Tw2\$	-
Sample Date/Time:	4/5/18 1325	_
Sample Collected From	m: Bathoom (sometans) Kirchen aerator	no do not
Comments:	· · · · · · · · · · · · · · · · · · ·	- -
		_
		133 0
		_
	(DQ)	_
Population: 6		_

Resident Name: Klew, John
Address: Banglebrink?)
Mailing Address: P.O. Box 314 St. Junes, 19 11780
Treatment Type (if applicable): Musingt
Location of Treatment System:
Sample No. SGC-9804- TW 25
Sample Date/Time: 4/5/48 / 1345
Sample Collected From: Buthson Tab (Kitcher against a 10 us
Comments:
Treatment byfused
Population 2

RESIDENTIAL SAMPLE LOG

Resident Name:	Kline
Address:	2 Watercrept
	St. Tames, vy 1.780
Mailing Address:	Same
Treatment Type (if ap	oplicable): Micomat (Aunthre out mit file)
Location of Treatmen	System: Basement
Sample No.	SGC-9804- TW26
Sample Date/Time:	4/5/48 1550
Sample Collected From	m: Busemens Bathown (or one; beaut)
Comments:	
Treatment	bypaised by closing values to filter.
	<u>'</u>
·	
· 	
Population 2	
į	

000024

RESIDENTIAL SAMPLE LOG

Resident Name: _	Carlson, Tia
Address: _	17 PINSEK
_	St. Junes, ny 11780
Mailing Address: _	Same
Treatment Type (if app	licable): i Row/100, ment Fifter
Location of Treatment S	c
Sample No.	GC-9804- TW27
	4/s/as 1615
	outrise shipos
Comments:	
110 By Pal)	(could not get again off of Kitchen)
·	relitant to let ITART surle LPStain
	Saw ne costo sinte outlide Mys
Population 4	<u>@</u>
- Comman Lui	

000025

Resident Name:	Zeltmann, Htold
Address:	BARN LANE
	S+ June1
Mailing Address:	Sime
Treatment Type (if applicabl	•
Location of Treatment System	
Sample No. SGC-	9804- TW28
Sample Date/Time:	•
Sample Collected From:	Kitchen Too
Comments:	
Micromot	topse by Passed by clasing vole
to filter a.	o opening
Population /	
	•

Resident Name:	Pisco	
Address:	ID Barn LANE	
	St. James, My 11780	
Mailing Address:	Same	
Treatment Type (if ap	et System: Basement	,
Location of Treatment	t System: Bassment	
Sample No.	SGC-9804- TW29	
Sample Date/Time:	4/5-/a7 1700	
Sample Collected From	m: Kitchen Tap	****
Comments:	· ·	
		P
Population 2	ζ	

Resident Name:	Elflein, Parl
Address:	16 Form RO
Mailing Address:	St. James NT. 11780 Same
Treatment Type (if ap	plicable): Microret (ison/100, ment)
Location of Treatment	System: Dowiter
Sample No.	SGC-9804- TW3D
	4/5/A8 1715
	Kitchen Tud (dounstains)
Comments:	
Soule To	restrient costs not be by passed (neither
Kitchen	ur shigot).
Population 3	399
Tomacien >	

Resident Name:	XippoLitos, George	
Address:	11 Gate Ro	
	St. Junes, NY 11780	
Mailing Address:	P.O. Box 2076	
	1+. Tames, My 17780	
Treatment Type (if ap	oplicable): Micromet Leeder (Leeder) t System: Busement	
Location of Treatmen	t System: Busement	
Sample No.	SGC-9804- TW31	
Sample Date/Time:	4/5/08 1735	•
Sample Collected From	m: Bosement Pigot (prior to Sodiment G	lter)
Comments:		
MIL MART +	leeder was trined off.	
Population 2		
i .	000029 Database Entry:	

Resident Name:	NADramia, Steen
Address:	St. Janes, NY (1770
Mailing Address:	Same
Treatment Type (if ap	
Location of Treatment	_
	SGC-9804- TW3Z 4/5/ap 1750
Sample Collected Fron	: Basement stigot from to treatment
Comments:	•
Hose rus	to Prope were from Doubtars spigot
Population: 4	
1	

Resident Name:	Mearley David
Address:	46 Form Ro.
	46 Form Ro. St. James, My 11780
Mailing Address:	SAME
Treatment Type (if ap	plicable): Micromet (Not operating)
Location of Treatment	System: Basenert
Sample No.	SGC-9804- Tw33
Sample Date/Time:	4/5/28 /800
	n: Kitchen Tas
Comments:	·
Treatment	ut operational
Population 4	- 6

Resident Name:	Starr, VANESSA	
Address:	Starr, Varessa 8 Fells way St. James, My 11780	••
	St. Tanel, My 11786	
Mailing Address:	SAME	
Treatment Type (if ap	plicable): None	
Location of Treatment	System: 4/4	
	SGC-9804- Tu34 & Tu35 Link	
Sample Date/Time:	4/Har 1830	,
Sample Collected Fron	Kitules sick deal	10.5 10.5
Comments:	·.	
	B	
Population 5		

RESIDENTIAL SAMPLE LOG

Resident Name:	Merkle, Laine
Address:	46 Moriches AD.
	St. James, NY 11780
Mailing Address:	SAME
Treatment Type (if a	pplicable): No Treatment
Location of Treatmen	nt System: NA
Sample No.	SGC-9804- TW36
Sample Date/Time:	4.5.98 1845
Sample Collected Fro	om: Kitchen Tud (aerator remuned)
Comments:	
No Tres	tment.
,	
-	
Population	H
- comanco	-/-

000033

Resident Name:	Nissequague	Fire	Department	(Howard
Address: 1	of Moricher Lo			·
	St. James, NY	פצרון		
Mailing Address:	Same			
Treatment Type (if a	pplicable):	l		
Location of Treatmen	nt System:	•		
Sample No.	SGC-9804- TW37			
Sample Date/Time:	4-5-98 /1	930		····
Sample Collected Fro	om: <u>Kitchen</u> S	PIGOT		
Comments:	·			
<i>D</i> »	Tratment.	<u>.</u> .	-	
. ~				
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	MS/MST)
Population				

RESIDENTIAL SAMPLE LOG

Resident Name: KINST	avd v	
Resident Name:	Lapive	
Address:	3 Harbor Rd	
	Head of the Harbor, 11780	
Mailing Address:	Same	
Treatment Type (if app	plicable):	
Location of Treatment	System:	
Sample No.	SGC-9804-TW038	
Sample Date/Time:	4/6/98 1210	
Sample Collected Fron	n: Kitchen sink	
Comments:	· · · · · · · · · · · · · · · · · · ·	
No	treatment	
	· · · · · · · · · · · · · · · · · · ·	
	(D)	·
Population: 3		
1	00000	î

000035

RESIDENTIAL SAMPLE LOG

Resident Name:	Joann Kuri
Address:	8 Harber Rd
	Head of the Harbor 11780
Mailing Address:	P.O. Box 63
	St. James 11780
Treatment Type (if ap	oplicable): <u>carbon or particulate (can't te</u> ll
Location of Treatmen	_
Sample No.	SGC-9804-TW039
Sample Date/Time:	4/6/98 1225
Sample Collected From	m: prior to treatment in basement
Comments:	
could n	ot remove filter
Population 5	(I nanny ~ 11 hrs/day)
1	

000036

RESIDENTIAL SAMPLE LOG

Elizabeth Shepherd Resident Name: 18 Harbor Ro Address: Hood of the Harbor 11780 Same Mailing Address: carbon filter Treatment Type (if applicable): Location of Treatment System: SGC-9804- TW040 Sample No. 4/6/98 1245 Sample Date/Time: entside two prior to treatment system Sample Collected From: Comments: Population: (3 animals

000037

Resident Name:	Flizabeth Knodel
•	Flizabeth Knodel owner Joseph Femino.
Address:	47-84 Harbor Rd.
D. G. 18. A. 1. 1	Same
Mailing Address:	
Treatment Type (if app	System: No treatment
Location of Treatment	System: N/A
Sample No.	SGC-9804- TW41
-	4/6/98/1315
Sample Date/Time:	
Sample Collected Fron	: Kitchen Sinc
Comments:	
Same was	for 47 & 49 Harbor Rd.
Ponulation à	2 cor #47
Population: 2	7 1419
	Database Entry:
	000038 Database Entry:

Resident Name:	Martin Nicholas
Address:	45 Hitherbrook Rd.
Mailing Address:	SAME
	plicable): whele house water filter (Put/sed) System: Basement by the tank
Location of Treatment Sample No.	SGC-9804- TIME 2
	4/6/98/1340hrs
Sample Collected Fron	1: Bathyoom
Comments:	Not(SB) Treatment system cannot be
by passed	we could not get the acrator off the
-tap	<u> </u>
Population 5	

Resident Name: _	Lambert Seizel dan
Address:	47 Hitherbrook 23 Hitner brook Rd. St. Tames
Mailing Address:	Same
Treatment Type (if appl Location of Treatment S	icable): <u>Perst & Sediment</u> ystem: <u>Barement</u>
	GC-9804-7N043
Sample Date/Time:	
Sample Collected From:	Kitchen link
Comments:	Bypassed the treatment system to collect
	the Kitchen.
Population 2	

Resident Name:	Joanne D' Jay
Address:	60 Harbor Rd
Mailing Address:	- SAME -
Treatment Type (if ap	plicable): Rust/Sediment falty
Location of Treatment	System: Basement
Sample No.	SGC-9804- TW044
	16/98 / 1540 Krs
Sample Collected From	n: <u>leitchen sink by passed the treatment</u> system.
Population: 2	

Resident Name:	Bonnano, Dominic
Address:	43 Farm Rd
Mailing Address:	_5ame -
Treatment Type (if app	olicable):
Location of Treatment	System: Unknown
Sample No.	SGC-9804- TWO 45
Sample Date/Time:	4/6/98/1600
Sample Collected From	: Spiget out Bide in the backyard.
Comments:	could not access the towarment system.
	rollided by the caretaker. She did not know
	atment by ten was. The Aven agreement
Say Ph. 8	pigot in the baluyard has untreated
water.	
Population	1:5 (1 care taker)

RESIDENTIAL SAMPLE LOG

Resident Name:	Dame, Karen
Address:	19 Pinoak Lane
Mailing Address:	— Same —
Treatment Type (if application of Treatment	2/0
Sample No.	SGC-9804- Two 46
	4/6/48/1630 WS.
Sample Collected Fron	
	Gesting Public Supply at the
<u>Carliest</u> .	
topulation 4	(2aduls +2 children).

Resident Name:	Joseph	Hochstrasser	<u> </u>	
Address: _	<u>3</u> Ga	ite Rd.		
Mailing Address:	— SAMT —			
Treatment Type (if app	olicable):	NONE N/A		
Sample No.	6GC-9804- TW	047		
Sample Date/Time:				
Sample Collected From	: <u>K</u> i	itchen sink		
Sample Collected From Comments:	Noi	ne		
_				
Population: 2	-			®

Resident Name:	L. 2	B	ONAGURA		·.
Address:	<u>3</u> S	WAN PI	ACC		
Mailing Address:	Nisse SAME	·	11780 3000		
				reaco di li construire de con	
Treatment Type (if ap	plicable):	Se Di reci	carrestope	FITCE	+ ~`co~
Location of Treatment					
Sample No.	SGC-9804-4	გ			
Sample Date/Time:	4/6/98	1753	5		
Sample Collected From	n: <u>Κ΄ τ</u>	chi T	A P		
Comments:			T-ANNA CONTRACTOR		
Pop: 5	(3 chin)?ei)		(TP)	

Resident Name:	L'NDA Peterson
Address:	3 (OSDWOED PATH
Mailing Address:	SAME AS ABOVE
Mailing Address:	Space HS HISGOC
Treatment Type (if app	plicable): No NC
Location of Treatment	System:
Sample No.	SGC-9804- 49
Sample Date/Time:	4/6/98 1815
Sample Collected Fron	157 Floor BATHER TAP.
Comments:	CArson wearnt was severed A Nonger
of years s	+C-0
-4F	
Per: 2	ि

RESIDENTIAL SAMPLE LOG

Resident Name:	CORDWOOD PATH SPRING
	Duntoni
Address:	COLD MOOD DATH
Mailing Address	りぃゃてゃん
11441115	
Treatment Type (if an	nliashla):
	plicable): \sim 0
	System:
Sample No.	SGC-9804- ≤ ○
Sample Date/Time	4/6/48 1320.
Sample Collected From	n: Cal D Lood PAR Spling - Hose
Comments:	
2 2	
Gob - wor	1

RESIDENTIAL SAMPLE LOG

Resident Name:	Beighlay, Judith 5 Swan Place
Address:	5 Swan Place
Mailing Address:	— Same. —
Treatment Type (if app	plicable): No treatment system
Location of Treatment	System: None -
Sample No.	SGC-9804-051 + MS/MSD
Sample Date/Time:	4/7/98/1130
	: <u>kitchen Sink</u>
Comments:	•
Papulation:	3

000048

DA Nue

RESIDENTIAL SAMPLE LOG

Resident Name:	Reed
Address:	10 Swan Place
Mailing Address:	- Same -
Treatment Type (if ap	plicable): Aqua future. L'Bacterios tatic treatment sy
Location of Treatment	: System: <u>Basement</u>
Sample No.	SGC-9804-052 / 5GC-9804-053 (Dupe of 052).
	417198/12 NOON 1155 for 052 & 1200hrs for 0
Sample Collected From	m:
Comments:	Aquaputure bystem was connected and sampling the bacteriostatic
system 1008	not operational.
	The transfer of the transfer o
- Control of the Cont	
	(D#)
Population 4	(Infant)
	000040 Database Entry:

000049

Resident Name:	Spangher & Vivian
Address:	26 Cordwood Path
Mailing Address:	-Same - P.O. Box 696 St. James, 11780
Treatment Type (if ap	plicable): Carbon for whole house & UV for bathro
Location of Treatment	
Sample No.	SGC-9804- & TW 054 (before treatment) OSS (after 417/98 / 054 - 91225 LVS / 055-1235 hrs.
Sample Date/Time:	417/98/ 054 - 1225 Lrs /055-1235 hrs.
Sample Collected From	n: Bathroom tap
	Before the treatment Bystem was installed
a sampling	event conducted by SCDH indicated
a PCF hi	t of 34 PPb. (Please see attached
a copy of the	e results). After the treatment was
installed the	e yesults). After the treatment was a per was non-detect. (See althebed).
* Two 189	mples wave collected by START, one before
to eatment (by	passed the System) + one after treatment.
go pul ation -	6 (prinding 2 children).

RESIDENTIAL SAMPLE LOG

Resident Name:	Fldridge
Address:	15 Carman Lane
Mailing Address:	-None-
Treatment Type (if ap	plicable): Nont
Location of Treatment	System: Non-
Sample No.	SGC-9804- 056
Sample Date/Time:	4/7/98 / 1305 Kr.S
Sample Collected Fron	n:
Comments:	· · · · · · · · · · · · · · · · · · ·
population: 4	
1 12000	
	Detabase Francisco

000051

RESIDENTIAL SAMPLE LOG

Resident Name:	Franco
Address:	21 Carman Lane
Mailing Address:	- Same -
Treatment Type (if app	olicable): <u>lay hiculate</u> System: <u>13 asc ment</u>
	SGC-9804- 05 7
Sample Date/Time:	4/7/98/1330hrs
Sample Collected From	: <u>kitchen</u> Lsink.
	Particulate System could not be
	· · · · · · · · · · · · · · · · · · ·
- O 1	
	B
population:	5

000052

RESIDENTIAL SAMPLE LOG

Resident Name:	Donton, Harlow	
Address:	7 Carmon Lane	
Mailing Address:	-Same-	···
Treatment Type (if ap	olicable): None	
Location of Treatment	System: None None System:	
	SGC-9804- 05 🕏	
Sample Date/Time:	41498/1525	
Sample Collected From	: Kitchen, tap (not the sink)	
Comments:		
	- A	
Population: \$	3	
7		

000053

RESIDENTIAL SAMPLE LOG

Resident Name:	tei Lieffrig
Address:	9 Branglebrink Rd.
Mailing Address:	- Same -
Treatment Type (if ap	D coamant
Sample No.	SGC-9804- 859
Sample Date/Time:	4/7/98/1550 MS
Sample Collected Fron	
Comments:	By page of the Carbon unit before the
	collected.
	(P)
Mpulation: 2	

000054

Resident Name:	mee, valerie
Address:	15 Branglebrink Rd.
Mailing Address:	PO. Box 2166 St. James 11780
Treatment Type (if ap	plicable): Mi cromat waterfilter Particularly filter System: Bagement
Location of Treatment	System: Basement
Sample No.	SGC-9804- ©69 06D
Sample Date/Time:	417/98/1605
Sample Collected Fron	n: 1Citchen Sink.
Comments:	By passed the system to collect the
Csample.	
Population: 2	
	000055 Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Syvertsen	•
Address:	21 Branglebrine Rd.	
Mailing Address:	P.O. BOX 419 St. James 11780	
Treatment Type (if ap)
Location of Treatment	System: N/A	
Sample No.	SGC-9804- 070 061	
Sample Date/Time: 4	17/98/1615	
Sample Collected From	n: <u>Kitchen Sink</u> ,	
Comments:	They have a micromet filter but have	
not been	using it for about a months.	
Topulation:	3	
,	Database Entry:	

000056

RESIDENTIAL SAMPLE LOG

Resident Name:	Gillison Geralaine
Address:	Brandebruk Ro
~	4 Morches RD 7 Tames, N7 11780
Treatment Type (if application	able): No Treatment or well (for converge on Kitchen top
Location of Treatment Sys	<i>j</i>
Sample No. SG	C-9804- 062 (ns/n/D)
Sample Date/Time:	
Sample Collected From:	Back spiget
Comments:	
Hore a Born	N on same well. No other wells on
6 low paper	-
Population 2	

000057

Resident Name:	Hurtado
Address:	3 Friends Way
Mailing Address:	-Some -
Treatment Type (if ap	plicable): Unknown filty in basement (approx 3 gallo
	System: Basement.
	SGC-9804- 063
Sample Date/Time:	4/7/98/1650
Sample Collected Fron	n: <u> Citchen 18ink</u> .
	The filty is of unknown type and approx.
3 gallone Co	epacity. Bypassed the system before the
Baimple eve	ut.
Population:	2

Resident Name:	Hehir, Lava	
Address:	50 BRANGEBINE	
· · · · · · · · · · · · · · · · · · ·	St. Tunes My 11280	
Mailing Address:	Sine	
Treatment Type (if app	System: Basement File (microsof/Aqua)	e.
Location of Treatment	System: Basement	
	SGC-9804- 064	
Sample Date/Time:	4/8/a7 1250	
Sample Collected Fron	Kitchen Tap	
Comments:	,	
Treatme	ent coup not be bypassed, sample	
	Lown Such w Kitchen	
Pololatoro:		

Resident Name:	WATTER JOAN
Address:	19 Comm Dr. St. June Ny 11720
Mailing Address:	Salte
Treatment Type (if a	pplicable): Micromet (And
Location of Treatmen	t System: hisement
Sample No.	SGC-9804- 06)
	4-8-08 1310
Sample Collected Fro	m:
Comments:	
·	
	R
Portetion	3

esident Name: Chroni, Evylyn
address: 37 Farm Ro
Same
reatment Type (if applicable): Micromot (ourse useld not let is in baseness cocation of Treatment System: Baseness
ocation of Treatment System: Brewent
ample No. SGC-9804- 066
Sample Date/Time: 4898 1345
ample Collected From: Lang Ason TAP
Comments:
Sample 18+ Bypares
Porlation 1

RESIDENTIAL SAMPLE LOG

Resident Name:	Goldstein	······································
Address:	57 Harbor H. 1 Ro St. Times My 17280	
Mailing Address:	Same Same	
Treatment Type (if ap	oplicable): Nous	
Location of Treatment	System: 4/4	
Sample No.	SGC-9804-067 and Dellas	re 68
Sample Date/Time:	4/3/28 1400	1405
Sample Collected From	m: Kitchien T. Kil	
Comments:		
Porlation	2	\$

000062

Resident Name:	Gross Kopf, Otto
Address:	211B Pirez Lous
Mailing Address:	St James, NY 11780 SAME
Treatment Type (if ap	oplicable): <u>Nove</u>
Location of Treatment	System: NA
Sample No.	SGC-9804-7-69
Sample Date/Time:	4-8-98 / 1550
Sample Collected From	m: Kitchen Tax
Comments:	137 well
No tre	utnert
267' wel	И
Dor lation	2

Resident Name:	Rich, Grace a Afavardra	
Address:	Rich, Grace & Afaindra 547 Morther Ro	
Mailing Address:	P.O. Box 247 St. Inne)	
Treatment Type (if ap	plicable): None System: NA	
Location of Treatment	System: A	
Sample No.	SGC-9804- Tw70	
Sample Date/Time:	4/19/18 1615	
Sample Collected Fron	n: Back yord Trigot	
Comments:		
Pot tation	-2	

Resident Name:	MOUTI	1 Ba	roura	
Address:	Marches			
	Heas of	the H	randon	
Mailing Address:	Box 324	M 01/10	hes B	
	St. Jums	y, NT	11780	
Treatment Type (if ap	plicable):	Treatm	ward	
Location of Treatmen	System: $\sqrt{\Delta}$			
	SGC-9804- TW	71		······
Sample Date/Time:	48 as 1			
Sample Collected Fro	n: Path-o	in Tap		
Comments:				
SODH	sauther 2/23	ar	1,2 Dichlaretha	me 1 pt
			TE	6.7
			(A)	
Vope later	2			

RESIDENTIAL SAMPLE LOG

Resident Name:	Layburn, George
Address:	4 Thompson fine
Mailing Address:	5t. James, Ny 11783 Same
Treatment Type (if app	System: Busement
Location of Treatment	System: Busement
Sample No.	SGC-9804- TW72
Sample Date/Time:	4/9/48 1715
Sample Collected Fron	Basement spigot prior to treatment system
Comments:	
Courty W	rell Dalling Corp \$16 289-1655
Call whow:	

000066

RESIDENTIAL SAMPLE LOG

Resident Name:	Peeling Dennis	
Address:	St. Junes, My 11780	
Mailing Address:	St. James, My 11780 Same	·
Treatment Type (if a	pplicable): <u>Cerbor Luit</u> at System: <u>Bosement</u>	
Location of Treatmen	t System: Bosement	
Sample No.	SGC-9804- TW73	TW74
Sample Date/Time:	m: Bathoun TAU	1750 (PUT)
Sample Collected Fro	m: Balkova TAU	buthsom top
Comments:		
population	2	
,		

000067

RESIDENTIAL SAMPLE LOG

Resident Name:	Mekenna
Address:	2625 old mill Rd.
Mailing Address:	-Same-
Treatment Type (if ap	oplicable): Aqua Pure (Dirt/Rust)
Location of Treatmen	
Sample No.	SGC-9804-75 (MS/MSD)
	4/9/98 / 1250 hrs
Sample Collected From	
Comments:	Aqua pure filter could not be by passed
	Ph.
Population:	7

RESIDENTIAL SAMPLE LOG

Resident Name:	Bonvicino, perotny
Address:	35 Branglebrink Rd.
Mailing Address:	-Same -
Treatment Type (if ap	plicable): No treatment system
Location of Treatment	System: N/A
Sample No.	SGC-9804-76 / (Dupe)-SGK 9804-77
Sample Date/Time:	System: N/A TW SGC-9804-76 / (Dupe)-SGC 9804-77 4/9/98 / 1315 (Dupe - 1320)
Sample Collected Fron	: <u>kitchen Sink</u>
Comments:	
	(PT)
Population: 2	

Resident Name:	Becker, Lucy (owner Bonvicino)
Address:	263A OK Mill Rd.
Mailing Address:	- Same -
Treatment Type (if app	olicable): <u>Particulate filter</u> (omni House)
Location of Treatment	System: Basement.
Sample No.	System: <u>Basement</u> . TW SGC-9804-78 (Dupe)— SGC-9804-79
	4/9/98/1335 (Dype-1340)
	: Kitchen Hink tap.
	The Knobe neal the fittention system
	and could not be hypossed (58) The
	by-passed before the champles were
Collected.	v
Population: 3	

RESIDENTIAL SAMPLE LOG

Resident Name:	Avellino
Address:	22 Carman Lane
Mailing Address:	-Same -
Treatment Type (if a	
Location of Treatmen	•
Sample No.	SGC-9804- TUBO (Pre-treatment) / TWBI (Post-treatment)
Sample Date/Time:	4/9/98/1515 hrs /TW81-1525 hrs
Sample Collected Fro	m: Since in the Levelry Loom.
Comments:	By parced the filtration bystem to
take the w	ater sample. A post-treatment sample was
•	d at this house.
Population: 2	
· •	

000071

Resident Name:	McLaren
Address:	262 old mill Rd.
Mailing Address:	7Same-
Treatment Type (if ap	•
Location of Treatment	System: Barement
Sample No.	SGC-9804- TWB 2
Sample Date/Time:	419/98/1550 hrs
Sample Collected From	n: Kitchen sink
Comments:	By passed the treatment system before
educting th	e cample.
Population: 2	†

Resident Name:	Link, James
Address:	7 Pinoak Lane
Mailing Address:	- Same -
Treatment Type (if ap	oplicable): 2 filters for sed tout + charcon fil [4] t System: Busement.
	SGC-9804-TW83
Sample Date/Time:	4/13/98 / 1325 hrs
Sample Collected From	#1/3/98 / 1325 hrs m: outside Spigot before treatment. Would not let us inside to take a
Comments:	would not let us inside to take a
	e treatment system.
	d
	D. D
Population: 3	

RESIDENTIAL SAMPLE LOG

Resident Name:	Krautn	
Address:	Brangle borink Rd. (Gooseberry farm)	-
Mailing Address:	R.F.D. # 1, Box 15; movides Rd. St. James, 11780.	
Treatment Type (if ap	carbon filter (campbell) in kitchen	
Location of Treatment		
Sample No.	SGC-9804- TW84 Post-filteration) TW85 (Pre-filter	atin
Sample Date/Time:	SGC-9804- TW84 (Post-filteration) / TW85 (Pre-filter 1355hrs 4/13/98/ 1355hrs(TW84)/ 4/13/98/1410	•
Sample Collected From	n: TWB4-Kitchen Sink (Post-Treatme	nt)
Comments:	m: TWB4-Kitchen Sink (Post-Treatment TWB5-Spigot in the farm (Pre-treatment	ク
	·	
		•
Population: 2		4
		- 4

000074 Database Entry:

y:

RESIDENTIAL SAMPLE LOG

Resident Name:	Paladini
Address:	26 Branglebrink Rd.
Mailing Address:	-Same-
Treatment Type (if ap	plicable): No treatment System: N/A
Location of Treatment	System: N/A
	SGC-9804-TW86 (MS/MSD)
Sample Date/Time:	4/13/98 / 1530 hrs
Sample Collected Fron	
Comments:	
	(B)
Population.	1

000075 Databa

RESIDENTIAL SAMPLE LOG

Resident Name:	Heath, Elliott
Address:	259B old lost Lane
Mailing Address:	- game -
Treatment Type (if ap	
Location of Treatment	•
Sample No.	SGC-9804- TWB7
Sample Date/Time:	4/13/98 / 1555 hrs
Sample Collected From	1555 hrs Bathroom tap
Comments:	
Population: 6	

000076

RESIDENTIAL SAMPLE LOG

Resident Name:	H Weisman, Jack	
Address:	246 Stonegate	
Mailing Address:	- Same-	
Treatment Type (if ap	plicable): None	
Location of Treatment	System: None	
	SGC-9804- TW88	
	4/13/98 / 1/015	
	n: Kitchen Sink	
Comments:		
		•
, , , , , , , , , , , , , , , , , , , ,		
Population: 2	_	

000079

Resident Name:	Braiotta, Dominicu
Address:	252B Stonegate
Mailing Address:	Same - Alone-
Treatment Type (if ap	plicable): Arnway Carbon System: Wherneath Citchen Bink
Location of Treatment	System: December 1917
Sample No.	SGC-9804- TW 89
Sample Date/Time:	4/13/98 /1645hrs
Sample Collected Fron	n: Bahroom tap (no treatment for Bathroom water.
Comments:	water.

	· (P)
Population:	6
	\cdot . If

RESIDENTIAL SAMPLE LOG

Resident Name:	murral
Address:	257 old Post Lane
Mailing Address:	- Same -
Treatment Type (if ap	plicable): <u>Carbon Filter</u> (CUNO) System: <u>Basement</u>
Location of Treatment	System: Basement
Sample No.	SGC-9804- TW90
Sample Date/Time:	4/13/98 /1200 hrs
Sample Collected Fron	1: Launding room where there is unfiltered water
Comments:	
	Θ
Population: 4	
• ٧	

000079

RESIDENTIAL SAMPLE LOG

Resident Name:	De Boar
Address:	56 farm Rd.
Mailing Address:	-Same -
Treatment Type (if ap	
	SGC-9804- TW9!
	4/13/98/1745 hrs
	•
	ketchen Bink.
Comments:	Mr. De Boar informed us that the micromet
Can not be	MY. De Boar informed us that the micromet by passed The crystem is used for
	ation.
	W W
Population:	<i>Y</i>

RESIDENTIAL SAMPLE LOG

Resident Name:	Lanigan
Address:	26A Moriches Rd.
Mailing Address:	R.F.D. 26A, Moriches Rd.
Treatment Type (if ap	. 1/ A
Sample No.	SGC-9804-TW92
	4/14/98/1050hrs n: Kitchen Sink
Sample Collected Fron	n: Kitchen Sink
Comments:	
Population: 2	

Resident Name:	Pollina
Address:	3 Harbor Lane
Mailing Address:	-Same -
Treatment Type (if ap	plicable): None System: N/A
Location of Treatment	System: N/A
Sample No.	SGC-9804- TW93
Sample Date/Time:	4/14/98 / 1110 hrs
Sample Collected From	
Comments:	
•	
population:	3
rp	

Resident Name:	Cotoia
Address:	12 Highwoods CT. 8t-James 11780
Mailing Address:	-Same -
Treatment Type (if app	0
Location of Treatment	System: Basement
Sample No.	SGC-9804- TW94
Sample Date/Time:	4/14/98 / 1135 hrs
Sample Collected Fron	
Comments:	By-passed the Carbon System before
the sample	- was collected.
######################################	
	$\widehat{\omega}$
Population: 3	

RESIDENTIAL SAMPLE LOG

Resident Name:	Affa
Address:	33 Highwoods Ct.
Mailing Address: -	- Same -
Treatment Type (if ap	- , , , , , , , , , , , , , , , , , , ,
Location of Treatment	
Sample No.	SGC-9804-TW95/post-treatment) TW96 (Pre-treatment)
Sample Date/Time:	SGC-9804-TW95/post-treatment/ TW96 (Pre-treatment) 4/14/98/12/5/trs 4/14/98/12/30/trs Baltwoom Rink (Post-treatment) / Caspisot in garden (Pre-treatment)
Sample Collected From	n: Baltwoom link (Post treatment) / Caspisot in galden (Pre treatment)
Comments:	
	(FI)
Population: 2	

000034

RESIDENTIAL SAMPLE LOG

Resident Name:	Hayes
Address:	9 watercrest Ct.
Mailing Address:	-Same-
Treatment Type (if ap	
Location of Treatment	
	SGC-9804-TW97
Sample Date/Time:	4/14/98/1245
Sample Collected Fron	1: Kitchen Bink
Comments:	By passed the system to collect the water
Sample	, , , , , , , , , , , , , , , , , , ,
Population: 5	

000035

RESIDENTIAL SAMPLE LOG

Resident Name:	frey
Address:	2625 old mill Rd.
Mailing Address:	=Samr =
Treatment Type (if app	System: Basement.
Location of Treatment	System: Basement.
Sample No.	SGC-9804-TW9B
	H4198 /1305
Sample Collected From	Kitchen Bink
Comments:	By-puned the system before the cample
was tellecte	
Population: 4	

000086

Resident Name:	Graher
Address:	263 G. old mill Rd.
Mailing Address:	-Same-
Treatment Type (if ap	plicable): Carbon filler under the jeitzhen
Location of Treatment	System: underneath the kitchen wink.
Sample No.	SGC-9804-7W99
	4/14/98/ 1335 hrs
	: Kitchen (gink.
Comments:	there are two taps in the sink-one
	ted water and the other with treat carbon
treatment.	sample was collected from the unfreated
watertap	
\ \	Image: contract to the contract
Population: 4	

Resident Name:	pahlgard
Address:	34 Harbor Rd.
Mailing Address:	- Same -
Treatment Type (if ap	plicable): A Carbon + Softner in
Location of Treatment	System: basement
Sample No.	SGC-9804-TW100 HS
	4/14/198/1525
Sample Collected Fron	n 1. /-
	By Passed the treatment by them before
	was collected. The guest house reses
•	well for drinking water. purpose.
- Andrews	
	Ø
Ponulation -	Mone (2 1300n)

SMITHTOWN GROUNDWATER CONTAMINATION RESIDENTIAL SAMPLE LOG

Resident Name:	Tassinari
Address:	47 Moniches Rd.
Mailing Address	- Same-
Treatment Type (if app	olicable): <u>Mi Cromet water Softner</u> System: <u>Basement</u>
Location of Treatment	System: Basement
Sample No.	SGC-9804- TW101
Sample Date/Time:	4114198/1600hrs
Sample Collected From	H/14/98/1600hrs Kitchen Bink
Comments:	
The state of the s	
	(m)
population: 1	
	· · · · · · · · · · · · · · · · · · ·

000039

RESIDENTIAL SAMPLE LOG

Resident Name:	mendocha
Address:	Mendocha 253 Stone gate Lane
Mailing Address:	- Same -
Treatment Type (if ap	plicable): - None- System: N/A
	SGC-9804- TW 102-
Sample Collected Fron	1: 1/4/98/1625 n: 1/4/198/1625
Comments:	
Population: 2	
7	

0000030

RESIDENTIAL SAMPLE LOG

Resident Name:	De Leyer
Address:	23 movidue Rd.
Mailing Address:	-Same -
Treatment Type (if ap	plicable): — None-
Location of Treatment	System: N/A
Sample No.	SGC-9804- 7い 10.3
Sample Date/Time:	4/14/98/1645 hrs
Sample Collected From	n: Sink located in the barn.
Comments:	the establish place is a horse riding
	t. Three worners live at the establishment.
Population: 3	

000091

Resident Name:	Knight Roman Land
Address:	27A MORICHES RD. NISSEQUOQUE, NY 11708
Mailing Address:	Samo
Treatment Type (if ap	plicable): None
Location of Treatment	
Sample No.	SGC-9804- FLATOG TW/04
Sample Date/Time:	4/5/98 0935
Sample Collected From	n: <u>Kitchen Faucet</u>
Comments:	
Pap: 2.	
Ÿ	

RESIDENTIAL SAMPLE LOG

Resident Name:	- Hante	· ·
Address:	259 A old Pot Rd	
	18 St. Jame, NY 11708	
Mailing Address:	Same	
	tilt all Paras (— D. Mik
Treatment Type (if ap	oplicable): <u>Carbon Filters and Reverse C</u>	Brassiss.
Location of Treatment	_	_
Sample No.	SGC-9804- TW 105	
Sample Date/Time:	4/15/98 1000	
Sample Collected Fror	n: Kitchen Faucet	
Comments:	Activated Carlon Filler of the coho	<u>le</u>
have and	also neverse Osmosis for bienking	_ cuate
Treatment	system pypasser.	
		
	(F)	_ _
Population	6	7
•		4

000093

Resident Name:	Johnson, Anna
Address:	343 fiver Wissen Rim Rd St. James WY 1178
Mailing Address:	Same es Alsove
Treatment Type (if ap	plicable):
Location of Treatment	System:
Sample No.	SGC-9804- 1() 6
Sample Date/Time:	4/15/98 1035
Sample Collected From	n: Citchen Farecet
Comments:	
No tres	tment System
Well dep	the only 7 to 8 feet.
-	
80, 3	
- Hug	000094 Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Meyer
Address:	17A Forg Hollow
	St. James WY 11780
Mailing Address:	Same
Freatment Type (if ap	oplicable): Waler Softener
Location of Treatment	System: Water Soften Garage Basement
Sample No.	SGC-9804- TW 107
Sample Date/Time:	H(15/98 1140
Sample Collected Fror	n: Kitchen foucet.
Comments:	
Water	Softener by passed to Collect
Sample	
Pap: 7 +2 1	in Apartment

000095

RESIDENTIAL SAMPLE LOG

Resident Name:	Williams	· (Ren	En).	
1,441.0		windell	owne	\ .
Address:	33BSp	sing 1-(ollow)	Rd	
	St. Jame,	NY		
Mailing Address:	Same			
Treatment Type (if ap	oplicable):	V		
			· · · · · · · · · · · · · · · · · · ·	
Location of Treatmen	i	N 8		
Sample No.	DGC 7004	08		
Sample Date/Time:	4/15/98	1150		
Sample Collected From	m: Bethre	W.		
Comments:	No tracke	nd		
5th h	crese on	Windell	Preper	4
			1]/[[
		X		
				7)
Prole: 2		(g)	/ [
ı				

000096

V

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	K	gee			
Address:	245	K O	ld mill	Rd.	
	St.	James	, NY	11786)
Mailing Address:			P.O. Bo		
			+. Tames	, WY	1(780
Treatment Type (if ap	plicable):	Mone	2		
Location of Treatment	System:				
Sample No.	SGC-9804- T	-M 10	39		
Sample Date/Time:	1415	98		122	0
Sample Collected Fron	n: <u>Ba</u> t	lbrown	precet		
Comments:					
well	235	st			
	<u> </u>				
					
Population:	4				

000097

Resident Name:	Rapp
Address:	Rapp 8 Patridge Lane
Mailing Address:	Same
Treatment Type (if ap	pplicable): Nome
Location of Treatment	: System:
Sample No.	SGC-9804- TW110
Sample Date/Time:	4/15/98 1235
Sample Collected From	n: Kitchen Faucet
Comments:	
	ର
Pap: 4	
V	

Resident Name:	schoyer Scheyer
Address:	261B old mill Rd.
Mailing Address:	Same
Treatment Type (if ap	plicable):
Location of Treatment	System:
Sample No.	SGC-9804- TW 111
Sample Date/Time:	4)15/98 1255
Sample Collected Fron	n: <u>Kitchen Faucet</u>
Comments:	
Pop	Ta)

Resident Name: Tartaglia
Address: 14 Quail Path
Mailing Address: Same
Treatment Type (if applicable):
Location of Treatment System:
Sample No. <u>SGC-9804-TW 112</u>
Sample Date/Time: 4/15/98 14(0
Sample Collected From: <u>Litchen</u> Faucet
Comments:
No troutment system in the basement.
(Fig.)
PP:3
·

Resident Name:	Hayden (Renter)
Address:	264 River Rd.
Mailing Address:	Same
Treatment Type (if app	plicable): None
Location of Treatment	System:
Sample No.	SGC-9804-TW 113
Sample Date/Time:	4/15/98 1440
Sample Collected From	: Kitchen Faucet
Comments:	
_ Johnson	is the owner
	(a)
fp: 3	
7 0	

RESIDENTIAL SAMPLE LOG

Resident Name:	Berg	
Address:	23B Moniches	Rd. (1780
Mailing Address:	St. Jamy, NY P.O. BOX 204 St. James, WY	
Treatment Type (if ap	plicable): Nme	
Location of Treatment		
Sample No.	SGC-9804- TW 114	
Sample Date/Time:	4/15/98 1610)
Sample Collected Fron	n: <u>Kitches</u> Faucet	
Comments:		
		€P
Rapis 1		

000102

Resident Name:	Bevilacqua, Kathy
Address:	262 C old Mill Rd St. Janu , NY 11780
Mailing Address:	
Treatment Type (if ap	- l-
Location of Treatment	
Sample No.	SGC-9804- TW 115
Sample Date/Time:	4/18/98 1700
Sample Collected From	n: Bathroom Faucel.
Comments:	
	@
Pap: 1	
V	000103 Database Entry:

Resident Name:	Petersen
Address:	35 Hitherbrook Rd. St. James NY 11780
Mailing Address:	St. James N7 11100 Same
Treatment Type (if ap	plicable): Water Softener System: Basement
Sample No.	SGC-9804- (1
	4/15/98 17-20
Sample Collected Fron	Basement Faucet
Comments:	
Pap: Lt	
	/

ms/msD

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	Onshan	
Address:	21 Frug Hollow I ane	
Mailing Address:		
Treatment Type (if a		en
Sample No.	SGC-9804- TW 117	
Sample Date/Time:		
Sample Collected Fro	m: <u>Icitchen Fauot</u>	
Comments:		
Water	Softenes Cypressed to Collect sample	یر
	ब्रि	
Papi. 1		

Resident Name:	Bin	JO14501	2	. ·	<u>.</u>
Address:	38 A	Spring	170110 ~	ROND	
	<u></u>	9 -10 90 C	11280	·	
Mailing Address:	Same As	S ABOUR			
	· · · · · · · · · · · · · · · · · · ·				
Treatment Type (if ap	plicable):	carbon c	Dalish 1	- 1702, 2 500	Mar, word?
Location of Treatment		BASEMON T			
Sample No.	SGC-9804- 1	W 118			
Sample Date/Time:	4/5/9	8 18	10		
Sample Collected Fron	, ,				
Comments:	CARBON	Fire 1	Zuroved o	~g 5	and in G
(Wasinstar +	- Pargener	e Fire	B, PASS es) <u>.</u>	

Pop: 2					(51)

Resident Name:	DONAID Leslie
Address:	Nissequagre 11780
Mailing Address:	SAL AS ABOUC
	plicable): ION Exchange System: Basch
	SGC-9804- TW120
Sample Date/Time:	4/15/98 1845
Sample Collected Fron	n: 0,750e 57607
Comments:	In Exchange Bypassel For Smilling
Scho Sam	PIE 2/23/98 - NO PCE
Pop: 3	(ov)

Resident Name:	0' connel, Bill
Address:	537 Moricher Rd.
Mailing Address:	-same-
Treatment Type (if ap	
Location of Treatment	System: <u>Basement</u> .
=	SGC-9804-TW121
Sample Date/Time:	4/16/98/0940
Sample Collected From	1: Davement spigot (before treatment)
Comments:	
	(ii)
Pop: 6	
1 1	

Resident Name: Lambert, Maureen.
Address: 47 Hitherbrook
Mailing Address:
Treatment Type (if applicable): Symples: Location of Treatment System: Basement
Sample No. SGC-9804- 7122
Sample Date/Time: 4/16/98 / 1010
Sample Collected From: <u>Kitchen Link</u>
Comments: By paked the treatment system before the
lample was collected.
tops 3

Resident Name:	De Nicole, Eugene
Address:	16 Quail Path Nissequague, Ny 11780
	Nissequague, NY 11780
Mailing Address:	-Same -
Treatment Type (if ap	plicable): Sediment/Particulate
Location of Treatment	system: Sediment/Particulate System: Ragement
	SGC-9804- TW123
Sample Date/Time:	4/16/98 /1045
Sample Collected Fron	•
Comments:	
Pop: 2	

RESIDENTIAL SAMPLE LOG

Resident Name:	Napolitano
	,
Address:	44P Woderest Drive
	St. James 11780
Mailing Address:	-Same -
	plicable): <u>Carbon Filty</u>
Location of Treatment	System: Basement
Sample No.	SGC-9804- TWIRY
Sample Date/Time:	4/16/98/ 1100
	n: Spigot outsite (before treatment)
Comments:	
·	
DD: 2	6
** 1	

RESIDENTIAL SAMPLE LOG

Resident Name:	Greenberg, Andrew
Address:	Greenberg, Andrew 274 River Rd.
	St. James, 11780
Mailing Address:	-Same -
Treatment Type (if ap	oplicable):None _
Location of Treatment	System:
Sample No.	SGC-9804- TW125
Sample Date/Time:	4/16/98 /1140 lms
Sample Collected From	46.31. 4
Comments:	
Pop: 4	(A)
	~

000113

Database Entry:

Resident Name:	Costello, Timothy
Address:	31 Thompson Avenue Lane
Mailing Address:	P.O. 464 St. James, NY 11780
Treatment Type (if applic	cable): Particulate/Seliment.
Location of Treatment Sy	stem: Basement.
Sample No. SQ	C-9804- TW 126
Sample Date/Time:	4/16/98/12/0 hrs
Sample Collected From:	E Kitchen Bink.
Comments:	En Kitchen Wink.
Pop: 2	लि

Resident Name:	De Leger, Johanna
Address:	23 moritue Rd.
Mailing Address	- Samc-
Treatment Type (if app	olicable): None
Location of Treatment	System:
Sample No.	SGC-9804- TW 127
Sample Date/Time:	4/16/98/ 1240
	: Kitchen Bathroom tap
	16 norides Rd. gets the water from the
•	ated on 23 mondes Rd.
	moperties 16 Maridus & 23 maridus are
	n Brandebrink Rd.)
Population; 3	
	000115 Database Entry:

/

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	Joe Badalato
Address:	300 River Rd, RFD# 2
Mailing Address:	St. James, WY 11780 Same
Treatment Type (if ap	l ass sul
Sample No.	SGC-9804- TW 128
Sample Date/Time:	4(16198 6 1310
Sample Collected From	m: Balbrown top
Comments:	Sediment filter not by-passed.
Dn 3	₽

Database Entry:

Duplicale

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	Cannata	-
Address:	211°C River Rd	_
	st. Jumes, NY 11780	_
Mailing Address:		- .
Treatment Type (if ap	oplicable): Cartridge Filler t System: Basement TW-14	-
Location of Treatmen	t System: Rasement TW-19	! 3
Sample No.	SGC-9804- TW 129	36
Sample Date/Time:	4/16/98 1425 14	£3 £
Sample Collected From	m: Basement	-
Comments:	Sample Colletted from the oretter	-
before the	Sample Colletted from the orether Cartidge filter	-
		•
		-
		-
		-
Papi 2		- (

Database Entry:

Resident Name:	McNulty, Sharon	· ·
Address:	258 Old Post Lane 3t. James, Wissequegue, 11780	
Mailing Address:	- Same -	
Treatment Type (if ap	J .	
Location of Treatment	-	(Ms/MsD)
	SGC-9804- TW130	(1003/1003 5)
Sample Date/Time:	4/16/98 / 1515	•
Sample Collected Fron	4/16/98 / 1515 n: <u>Kitchen tap.</u>	
Comments:	<u> </u>	
Population: 2		

RESIDENTIAL SAMPLE LOG

Resident Name:	Charles EISenson
Address:	q Smani Phace
	Nisseque 11780
Mailing Address:	site As Agere
Treatment Type (if an	plicable): CARBON UNIT, NICTORET + RO
Treatment Type (if ap)	•
Location of Treatment	System: CANDOW + MOTORET WORSENT - LO WARE
Sample No.	SGC-9804- TUISI + TWISZ
	4/16/98 1610 + 1620
Sample Collected Fron	1: +w131 (consider soon since top) Post News
Comments:	+037 (00-200 25:00=) Dise Manne
carbon w	AS NOT BY PASSED DING SANling
	-GET WAS SAPILL FOR PIETESMENT
Supre.	
POP: 7 (4	(Cijorw)

000119 Database Entry:

ry:

Resident Name:	Lipp		
	,		
Address:	29 BIAN	6 14 BMNL	RD.
-	N. ssequerue	11786	
Mailing Address:	po sox	> .a	
-			
Treatment Type (if app	licable): NONE	Referred. N	que simalae
Location of Treatment			
Sample No.	GC-9804- T ₩ 133		
Sample Date/Time:	4/,6/98	455	
Sample Collected From	OUTSIDE SPI	SO T	
Comments:			
. Po c	ve home ourly	Sampling -	TOOK Spraip
Fram outsy	= 550c A:	somi me T	
			78
Po?: 0 A	- ICAST 1		(A)

	30 mi
Resident Name:	to y men
Address:	NISSEQUE UTES
Mailing Address:	Po Box 21
_	ST JAMES 11780
Treatment Type (if appli	cable): Conyon Softmer
	ystem: BASeet
Sample No.	GC-9804- TW 134
Sample Date/Time:	4/.6/98 1720
Sample Collected From:	Outside Sign in Hout YAT
Comments: 5	7:60: - 2000: 5 - ~ - col
ुग्दुः <u>3</u>	(A)

Resident Name:	KATHICEN RATHJEN
Address:	1 Spring Honow (previous 374)
	Nissequoque (ST James) 11780
Mailing Address:	SAME AS ABOVE + SATINGHOHOU H
Treatment Type (if ap	plicable): None
Location of Treatment	System: N/A
Sample No.	SGC-9804- TW 135
Sample Date/Time:	4/16/98 1740
Sample Collected From	n: Kitchen TAP
Comments:	
<u>∩</u>	P

Resident Name:	Leonard a Linda Tartamella
Address:	4 Wetherill Ln.
	St. James
Mailing Address:	same
Treatment Type (if ap	olicable): particulate/rust System: basement
Location of Treatment	System: basemenT
Sample No.	SGC-9804- 136
Sample Date/Time:	4/16/98 1825
Sample Collected Fron	kitchen sink
Comments:	·
pop (e	

Resident Name: John Yeliath	_
Address: <u>5 wetherfll Ln.</u> St. James	-
Mailing Address: Same	_
Treatment Type (if applicable): Location of Treatment System:	_
Location of Treatment System:	-
Sample No. SGC-9804- (37)	_
Sample Date/Time: 4 14 98 1840	_
Sample Collected From: which sink in basement	_
Comments: unable to bypass micromet	_
	_
	_
	_
	_
	_
	_
fap - 1	-
- vi	

Resident Name:	Michael	Brooks	·
Address:		selvilled. àmes	
Mailing Address:	Saw		
Treatment Type (if a	pplicable):	carbon	
Location of Treatmen	nt System:	posttroatment	pretreatment
Sample No.		W 13 8	TW139
Sample Date/Time:	4/14/98	1900	1910
		oom sink	
Comments:			
_			
·			
000-3			(P)
11		salati da 	

Resident Name:	Colin	Cla	arke	·	
Address:	21 TV	cree Siste	irs Rd Warbor		
Mailing Address:	Same		.		
Treatment Type (if a		carbon		ink → pa	ticulate
Sample No.	_				
Sample Date/Time;	4/14/98	1935			
Sample Collected Fro	m: bas	ement.	prior to	Siter	
Comments:					
		<u>, , , , , , , , , , , , , , , , , , , </u>			
	$\overline{}$				
					
Pop: 2				A	

RESIDENTIAL SAMPLE LOG

Resident Name:	Sal De Caro
Address:	6 Wetherill Ln
·	St. James
Mailing Address:	same
Treatment Type (if ap	plicable):
Location of Treatment	
	SGC-9804- 14\
Sample Date/Time:	4/10/98 2000
Sample Collected From	n: <u>kitchen sink</u>
Comments:	
pop. 2	

Database Entry:

Resident Name: Do No U AW	
Address: 8 WOOD CUTTERS NISSE QUOGUE 11780	
Mailing Address: SAR AS ARO-E	
Treatment Type (if applicable): No NC i O control in No NC i O control i	ACCSS
•	
Sample No. SGC-9804- 142	
Sample Date/Time: 1778 9:55	
Sample Collected From: 6-7 5 50 50 50 60 7	
Comments:	
Sample conected when Resident was not	tro me
From 6.78 Sp'607 So Presence/	
OF Treatment Not DeDuced Conclu	
	0
Por B 1	-

Resident Name:	MASTIN ABBENE
Address:	6 Tide Min ROAD
	ST JAmes 11780
Mailing Address:	Sme 25 A30-P
Treatment Type (if ap	plicable): Sofiwor
Location of Treatment	System: BAS
Sample No.	SGC-9804-TW 73 144
Sample Date/Time:	4/17/98 10:15
Sample Collected Fron	1: UPSTAIRS KITCHN TAR
Comments:	SOFTHER BYPASSEL FOR
SALPING	
Sc40 SA	-PIE 1-27-97 - 2 PPB PCE
Per: S	
1	

Resident Name:	DAU'D SOTT
Address:	261A OID MIII ROAD
	N. 550900900 11780
Mailing Address:	5, are as above
Treatment Type (if ap	plicable): Micromet
Location of Treatment	System: 345
Sample No.	SGC-9804- TW 145
Sample Date/Time:	4/17/98 1050
Sample Collected Fron	m: 15 Toler TAP
Comments:	
Pa?: 6	(3 (Li,0(eu)

Resident Name:	CNOI PUGLESE
Address:	261P OID MII ROAD ROAD
Mailing Address:	Nissequeque 11780 Same as Albour
Treatment Type (if ap	pplicable): Nove t System: N/A
Location of Treatment	t System: $^{\sim/\Lambda}$
Sample No.	SGC-9804- TW146
Sample Date/Time:	4/17/98 1105
Sample Collected From	m: Kitclen TAP
Comments:	
Pap: 1	अ
1 - 1	

Resident Name:	MOSTON SheDrofsky
•	/
Address:	27 HIGH WOODS COUFT
	57 JAMES 11780
Mailing Address:	SAME AS ABOVE
Treatment Type (if ap	plicable): microme T
Location of Treatment	plicable): microme T System: BAccuert
	SGC-9804- TW 147
Sample Date/Time:	4/17/98 1135
Sample Collected From	n: Demostairs PATHICOM TAD
Comments:	
	B
Pop: 2	

Resident Name:	Michael Davis
Address:	16 Highwoods Court ST JAMES 11780
	ST 5 Ares 11780
Mailing Address:	Same As Asove
Treatment Type (if ap	plicable): New ? System: N/A
Location of Treatment	System: NA
Sample No.	SGC-9804- TW148
Sample Date/Time:	1: Liming Room TAP
Sample Collected Fron	1: Limity Room ATAP
Comments:	
Pop: 5 (3	chipsen)
	000133 Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Scott FeliceTTi
Address:	3 PINDAK LANE
	Member Te HAT.301 11780
Mailing Address:	3 P.NOA K
	ST JAMES 11780
Treatment Type (if ap	
Location of Treatment	System: N/A
Sample No.	SGC-9804- TW 149
Sample Date/Time:	4/17/98 1220
Sample Collected Fron	n: Kitchen TAP
Comments:	
POP: 3	(1 C W, D)

000134

Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Larry Moseley
Address:	64 Harbor Rd Head of The Harbor N. V. 11780
Mailing Address:	P.O. Box 574 ST James Ny 11780
Treatment Type (if a	applicable): Mone
Location of Treatment	nt System:
Sample No.	SGC-9804- TW150 1525
Sample Date/Time:	April 3, 1998 3-20 PM
Sample Collected Fro	
Comments:	
No. of People:	6

000135

Database Entry:

DU

RESIDENTIAL SAMPLE LOG

Resident Name:	J. Jarden Guenther
Address:	43 Haibor Rd St. Sames 11780
Mailing Address:	P.O. Box 57 ST. James 11780
Treatment Type (if a	pplicable): None
Location of Treatmen	t System:
Sample No.	SGC-9804- TW151 1545
Sample Date/Time:	14pril 3, 1998 3:40
Sample Collected Fro	
Comments:	
Population: -	1

000136

Database Entry:

M

RESIDENTIAL SAMPLE LOG

Resident Name:	Robert Bozza
Address:	Z7 Harbor Rel St James NY 11780
Mailing Address:	St James NY 11780
Treatment Type (if ap	
Location of Treatment	•
Sample No.	SGC-9804- 7615 Z 1613
Sample Date/Time:	April 3, 1998 - 3-95 PM
Sample Collected Fron	n: Kitchen Sink
Comments:	
Population 3	

M

Database Entry:

000137

RESIDENTIAL SAMPLE LOG

Resident Name:	Constance C. Helms
Address:	29 Harbor Rd
Mailing Address:	90. Box 224 St James 11780
Treatment Type (if ap	pplicable): \(\sum_{\chi_1,\chi_2} \)
Location of Treatment	: System:
Sample No.	SGC-9804- TW153 1730
Sample Date/Time:	April 3 1998 5=20
Sample Collected From	m: Kitchen Sink (Right Sink looking of
Comments:	/
Dopulation ?	

M

000138 <u>Database Entry:</u>

ntry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Cat	herine	Kenny	
Address:	12	Three	Kenny	Rof
Mailing Address:				·
Treatment Type (if a	pplicable):	Sedimen	+ /Rust c	ortvide ? to well tak
Location of Treatmer	nt System:	basen	ent next	to well tank
Sample No.				
Sample Date/Time: Sample Collected Fro	4/3/	198	18:17	PM
Sample Collected Fro	om: Fa	veet off	well (1st	Avail)
Comments:				
Type of in filter	Cartrio	ge curr	rently ins	ify leaf
in filter	5-15tem	not id	entifiable	
Population:	7			

m

000139

Database Entry:

Resident Name:	TO: +4 KAZMARICK
	1913 Rier RD. STJANCS 11780
Mailing Address:	Same 95 ABOUR
Treatment Type (if application of Treatment	System: NO
Sample No.	SGC-9804-TWIS S
Sample Date/Time:	12:55 1/4/a8
Sample Collected From	" UPSTRIRS BATLICOM
Comments:	
Ropulation: 2	A Duits

Resident Name:	AL RAUSTIGIA	
Address:	194A River R.D. Nissagenque 11780	
Mailing Address:	SAME AS ABOVE	
Treatment Type (if a	n\	
Sample No.	SGC-98047WISG	
Sample Date/Time:	1324 4/4/98	
Sample Collected Fro	om: K'-cluswx	
Comments:		
Population 2		@

Resident Name:	Sean Ourlan
Address:	195 River RD.
Mailing Address:	SAME AS ABOJE
Treatment Type (if a	ipplicable): (Ariti's ge Fittes - word And Carso The Segurice It System: MASCHUT (CARSON SINK)
Sample No.	SGC-9804- WI 5 7
Sample Date/Time:	1348 4/4/98
Sample Collected Fro	om: BATWoon sink Downgrans
Comments:	CAMON + SEDIMI FITTE
Dy passed	Fe. S And I, NS
Regulation 4	(2 (L'IDIEN)

Resident Name:	Scan Durham	
	SCAN DUTHAM (UNOCCUPIED RENTAI)	
Address:	190 B River RD.	
	ST. JAmes \$11780	
Mailing Address:	195 River RD.	
	195 River RD. ST. JAMES 11780	····
Treatment Type (if ap	•	
Location of Treatment	t System: ~/A	
Sample No.	SGC-9804-1W 5 8	
Sample Date/Time:	4/4/98 1407	
Sample Collected Fron	m: Dowstales BATLOOM	· · · · · · · · · · · · · · · · · · ·
Comments:		
		
		
Population Co	UCSWITTY O	√
Ga	waring 4 Propie	Need
	Database Entry:	CCA OF

Resident Name:	PETER MOST
Address:	ST. James 11780
Mailing Address:	Same as ABove
Treatment Type (if a	Mei-
Location of Treatmen	Fig. ~
Sample Date/Time:	4/4/98 435
	om: Kitchen toop
Comments:	Sistema 12, res (01 50 IT Republic
	COID NOT BY BASSED
Population 5	(1 chi)

Resident Name:	Jin Bishop
Address:	271 Sachen Hill RD ST JANES 11780
Mailing Address:	Same and A-Bare
	plicable): 2 c v FT Carson unit
Sample No.	SGC-9804- + W 160 AND SGC 4804TW 16 (POST MARKE) (PFC MARKE) 4/4/98 1502 PRE 1512(PSF
Sample Collected Fron	1: Kirchen TAP
Comments:	System ByPASCED AT FITTE
Fire Las	Been in For 1 year
and Twl	was collected while system was by parsed 61 was collected while the system was according to pare Rosoff (Telephone
Converedi	n on 4/28/98 - 1000hrs).
Population 1	

Resident Name:	GUALD Cohen
Address:	18 BROAL PATH
Mailing Address:	SAN AS AROR
Treatment Type (if ap	plicable): Parriculare Fires (54) Caronof
Location of Treatment	System: BASCOUT
Sample No.	SGC-9804- TW 162
Sample Date/Time:	1/4/48 /655
Sample Collected From	m: Kitchen Tap
	Private Sample - 2/03/98 - All Chav.
Population 2	

Resident Name:	Mushay Voelker
Address:	24 Brigal PATL
Mailing Address:	S some As 12000
Treatment Type (if ap	plicable):
Sample No.	SGC-9804- Th 163
_	4/4/48 170
Sample Collected Fron	n: 0075 De 50 607
Comments:	House unso constration commenty
Population 3	



RESIDENTIAL SAMPLE LOG

Resident Name:	Charles CAIABLESE	
Address:	3 Bridal Park	
	St James 11780	•
Mailing Address:	Same AS ABOVE	,
· · · · · · · · · · · · · · · · · · ·	pplicable): Particulate Filton CATOM	Λ.
		3
Location of Treatmen	at System: 3ペンペルて、	
Sample No.	SGC-9804- + w 16 4	
	4/4/98 1718	,
Sample Collected Fro	m: Kirchi TAD	
Comments:	Pulled For 40 minutes AMST	
) ce? well	
Population 4	(2 (LIDEN)	
	/	,

Database Entry:

Resident Name:	ARD'S HONOHAN
Address:	Nissequeque 11780
Mailing Address:	SAME AS ABOVE
Treatment Type (if apple Location of Treatment	
	SGC-9804- TW165
	4/4/58 1740
Sample Collected From	DOWNSMIRS BATLIOOM
Comments:	
	(A)
Population 4	7 Duit 5

Resident Name:	Brian BOGAFT
Address:	40 SPNAG HOUGH
	Nissequeque 11780
Mailing Address:	Same AS ABOIC
Treatment Type (if ap	oplicable): Seising Sinces/ Carron
Location of Treatment	System: Crant space work Louse Post Post SGC-9804- TW 166 + 1W 167
Sample No.	SGC-9804- TW 166 + TW 167
Sample Date/Time:	4/4/98 1810 1825
Sample Collected From	m: Kitchen TAP + GUTSTOR SPIGOT
Comments:	butsing spilet LAS DBS pipe
Marachyl.	- NOT POTABlile - Filter onner house
SIEFCULT TO	my21255
4-7	
Population 5	(3 ChiDCeN)

Resident Name:	Roy STEIGIBIEL
Address:	30 SPING HOHOW
	Nissequaçõe 11780
Mailing Address:	Same As Ase
Treatment Type (if ap	plicable): Contert oje celiment Fire?
Location of Treatment	System: BASemen
Sample No.	SGC-9804-1468 + SGC 9804 169 (DUPL CATE)
Sample Date/Time:	4/4/88 1847 + 1849
Sample Collected From	n: Dows ANS BATHOOM.
Comments:	First Dy 3 Assel During Spulling
Population 3	(1chi,D)

Resident Name:	DEV CHTKARA
Address:	6 BriDAE PATH
	Nissequeque 11780
Mailing Address:	SAL AS ABOUR
Treatment Type (if ap	plicable): Pw Ne inizeR
Location of Treatment	System: Boiler Room
	SGC-9804- 1 7 O
Sample Date/Time:	4/4/98 1910
Sample Collected From	n: BATHOOM TAP - FIRST FLOOR
Comments:	By PASSED TRE PAY System FOR
SAMPlinG	
Population 3	(P)

RESIDENTIAL SAMPLE LOG

Resident Name:	Micheal HAII
Address:	15 Br. DIE PATL
	Ni 550 9 009 00 1080
Mailing Address:	SAME AS ABOVE
Treatment Type (if ap	eplicable): $\frac{N \cup N \cup C}{N \setminus A}$
Location of Treatment	System: N/A
Sample No.	SGC-9804=[v] [
Sample Date/Time:	4/4/98 1930
Sample Collected Fron	n: Kitcher TAP
Comments:	
	₩.
Population 5	(3 (L'IDREN)

000153

Resident Name:	<u>Clenn</u>
Address:	3 Woodcotters Path
Mailing Address:	
Treatment Type (if ap	
Location of Treatmen	t System: Disement
Sample No.	SGC-9804- TW172
Sample Date/Time:	m: Kitchen Sink
Sample Collected From	m: Kitchen Sink
Comments:	
APARAN WALLEY	
Sample	13/1949sed Cilligan
	/ · · · · · · · · · · · · · · · · · · ·
Population 5	In

Resident Name:	Clahane
Address:	6 Woodertfers Path
Mailing Address:	
Treatment Type (if a	pplicable): Culligan Softener which in line at System: Lasement
Location of Treatmen	it System: 1995 envent
Sample No.	SGC-9804-7W173 12V50
Sample Date/Time:	4/5/98 12:50
Sample Collected Fro	
Comments:	
Culligan	hypassed (push buttan)
	192 ft death well
	wey
- 112	On
Population: 3	J 101

Resident Name:	Dic	Carlo		· .
Address:	9 W	evolutes		· · · · · · · · · · · · · · · · · · ·
Mailing Address:		Same		
Treatment Type (if ap		Colligan Da semon	\$ 50	Herre
Location of Treatment	System:	Da germon	$f_{}$	
Sample No.	SGC-9804-	TW174		
Sample Date/Time:	4/5/9		2:10	
Sample Collected Fron	n: bac	Kyard fau	icet (refund pool
Comments:		· fauce	+	·
			00	
	May 1			
	(Ningo (house		
	l l			
Deputation 4	1			2m
		000156	<u>Databas</u>	Entry:

Resident Name:	Rei tano
Address:	42 Springhollow
Mailing Address:	
Treatment Type (if ap	plicable): Nove
Location of Treatment	System:
Sample No.	SGC-9804- TW175
Sample Date/Time:	April 5, 1998 14:10 bothwoom sink (off to left of front drop)
Sample Collected Fron	1: bothwoom Sink (off to talk of front der
Comments:	
family.	moving out - house sold.
	$\widehat{\mathscr{P}}$
Population 4	Sm

Resident Name:	Greshin		
Address:	Cordwood St Junes.	" P+	
Mailing Address:	/ Sunso		
Treatment Type (if applicable): Location of Treatment System:	Culligan S basement	Seffence + C	Culligan Carbon
		1000	
Sample No. SGC-980	14- /W/ F6	45.00	<u> </u>
Sample Date/Time:	5-98	15:0	<u> </u>
Sample Collected From:	Kitchen Sm	K	
Comments:			
Cullian So	Henry + C	ar hon	
hypussed C	push butta) for sa	mple
	•	J	·
			· · · · · · · · · · · · · · · · · · ·
Population 2			Dry

RESIDENTIAL SAMPLE LOG

Resident Name:	Reiss
Address:	20 Frog Hollow
Mailing Address:	
Treatment Type (if ap	oplicable): None
Location of Treatmen	System:
Sample No.	SGC-9804- TW177 15120
Sample Date/Time:	4-5-98
Sample Collected From	14-5-98 n: Kitchen Sink
Comments:	
Population Z	- In

099159

Resident Name:	Campbell
Address:	Springhollow Rel
Mailing Address:	P.O. Box 821 Smithtown 11787
Treatment Type (if ap	
Location of Treatment	
	SGC-9804- TW/78
Sample Date/Time:	4-5-98 15.95
Sample Collected From	4-5-98 15:45 m: Kitchen Sunk
Comments:	
sepulation:	Du
1	

Resident Name:		Cran				
Address:	10	Wood	Afes	Part	7	
Mailing Address:						
Treatment Type (if ap	oplicable):	Sea	liment 45eme	Ru	5/	
Location of Treatmen	t System:	10	35eme	n/		
Sample No.	SGC-9804	- TWI	79			
Sample Date/Time:	4/5	198		16:2	-5	
Sample Collected From	m:	Kitch	en ta	17		
Comments:	•		. /	,		
Ged ment	- Li	Her	n)oT	- bu	AG SSA	1
\(\tag{\tag{\tag{\tag{\tag{\tag{\tag{					,	
					· · · · · · · · · · · · · · · · · · ·	
				$\overline{}$	***************************************	
1.1.4	4				29	7.1
sopulation !	<u></u>					
		0	00161	Da	tabase Entr	v: []

RESIDENTIAL SAMPLE LOG

Resident Name:	Rizzofi	
Address:	16 Waterougt	
Mailing Address:		
Treatment Type (if ap	oplicable): Mecronef t System: besement	
Location of Treatmen		
Sample No.	SGC-9804- TW180	i
Sample Date/Time:	4/5/98 16:50	
Sample Collected From	SGC-9804- TW/80 4/5/98 16:50 m: Kitchen tap (Kitchen on right house - Ivoking of house)	e C
Comments:	- Gt house	7
_ NO by	pass for	
_mesomet.	micronnet empty	
population	2 Sm	

000162

RESIDENTIAL SAMPLE LOG

Resident Name:	_Silve	erman			<u> </u>
Address:	16 C	arna	Ln		
Mailing Address:					
Freatment Type (if ap		curbon buts		Henen	
Location of Treatment	System:	basemen;	<u> </u>	<u> </u>	
Sample No.	SGC-9804- 74	181		1:45	<u> </u>
Sample Date/Time:	4/5/	30	17	-:45	
Sample Collected Fron	n: <u> </u>	fairs b	pathron	m 5	'NK
Comments:		_			
Sample	with.	Carbo	en Un	,45	
	tener b	Carb.	1	valves	
in barem	e. T		,		
goulat,	- <u> </u>			W	21
1	ugy C				/
					1

000163

RESIDENTIAL SAMPLE LOG Resident Name: Address: sypen Mailing Address: Treatment Type (if applicable): Location of Treatment System: SGC-9804- TU/82 Sample No. Sample Date/Time: Sample Collected From: Comments: squ lation

000164

Resident Name:	Miner.
Address:	424 Woodcrest Dr.
Mailing Address:	
Treatment Type (if a	
Location of Treatmen	nt System: <u>basement</u>
Sample No.	SGC-9804- TW183 18:08
Sample Date/Time:	4/5-198 18:20
Sample Collected Fro	om: Sink believed washing machine 1st level of home
Comments:	1st level of home
Sedime	t cartudge typesseel
Ta Sin	uphe (Volves)
MICVOM	et NOT bypessed
populate	n 2 DM
, •	099165 Database Entry:

Resident Name: Maham
Address: 44 Worderst Dr
Mailing Address:
Treatment Type (if applicable): Sediment/Rust cartridge Location of Treatment System:
Sample No. SGC-9804- 7 W184
Sample Date/Time: 4/5/98 18:50
Sample Collected From: Kitchen teg.,
Comments:
sediment filter prossed
Sediment filter bypassed for sampling
population 2

Resident Name:	Walsh
Address:	1 Wood Cotters Park
Mailing Address:	
Treatment Type (if a	pplicable): Culligan Soften & Les emant
Location of Treatmen	t System: besement
Sample No.	SGC-9804- TW185
Sample Date/Time:	4/6/98 12:05
Sample Collected Fro	m: buthroom sink, next to kitcher
Comments:	
	hypessed (volves)
sepulation	;;5 <u>2</u>
/	` <u> </u>



Resident Name:	Remuzzi
Address:	11 Wood cotters party
Mailing Address:	
Treatment Type (if a	applicable): Micron et at System: 1>45ement
Location of Treatmen	nt System: <u>1948ement</u>
Sample No.	SGC-9804- TW186
Sample Date/Time:	4/6/98 12:25 om: Kitchen sink
Sample Collected Fro	om: Kitchen sink
Comments:	·
	et not hypossed.
_	
-	
sagar lafra	2 - 911
The state of the s	

Resident Name:	Schneider	
Address:	41 Woodcrest	
Mailing Address:		
Treatment Type (if a	pplicable): <u>Sediment Cartridge</u>	
Location of Treatmen	pplicable): Section on the Cartridge at System: beseinent	
	SGC-9804- 7WI&7	
Sample Date/Time:	4/6/98 12:50	
Sample Collected Fro	<u>4/6/98</u> 12:50 m: <u>Fritchen Sink</u>	
Comments:	·	
Sedime	at filternot bypossed	- <u>4</u> ,-
		_
D'Spilatio	n° 2 3m	
11 V		

Resident Name:	Lo Frese
Address:	41 Springhollow
— Mailing Address: —	
Treatment Type (if appl	icable): Sediment cartridge ystem: Basement
Location of Treatment S	ystem: Basement
Sample No. S	GC-9804- TW188
Sample Date/Time:	4/6/98 13:15
Sample Collected From:	
Comments:	
	Cantridge hypossed for sample
poplotion	\mathcal{Z}
	000170

Resident Name:	FINK
Address:	36 Springhollow
Mailing Address:	
Treatment Type (if ap	oplicable): None
Location of Treatmen	•
Sample No.	SGC-9804- TW189
Sample Date/Time:	4/6/98 13:30
Sample Collected From	SGC-9804- TW189 4/6/98 13:30 m: tritchen Sak
Comments:	
pop la fra	, 2

Resident Name:	Panasci
Address:	12 Bridg/ Path
Mailing Address:	
Treatment Type (if ap	plicable):
Location of Treatment	System:
Sample No.	SGC-9804- 190
Sample Date/Time:	4/6/98 16:00
Sample Collected From	4/6/98 16:00 n: Kitchen tags
Comments:	
population	2
popular m	

Duplicate

SMITHTOWN GROUNDWATER CONTAMINATION

Resident Name:	Mister	
Address:	32 Springhollow	
Mailing Address:	P.O. Box 297 St James 11780	
Treatment Type (if ap	plicable): MICVONAT System: 195em 217	
Location of Treatment	System: D950went	
Sample No.	SGC-9804- TW191 TW192	
Sample Date/Time:	4/6/98 /6:15	
Sample Collected Fron	n: <u>Kitchen Sink</u>	
Comments:		
populati	en 12	
•		. 1

muil general into an Sypertund.

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	Dwyer
Address:	Duyer 3 Fox Run
Mailing Address:	
Treatment Type (if ap	oplicable): \(\int \mathcal{U} \tau \mathcal{V} \tau \mathcal{E}
Location of Treatmen	t System:
Sample No.	SGC-9804- TW 193 16:45
Sample Date/Time:	4/6/98
Sample Collected Fron	m: 450th vom tap (near front cloer)
Comments:	
	(Ms/msD
poplation	4
1 1	

000174

RESIDENTIAL SAMPLE LOG

Resident Name:	Menny	
Address:	Menny 1 Fox Run	
	· .	
Mailing Address:		
Treatment Type (if app	plicable): Non L	
Location of Treatment	System:	
Sample No.	SGC-9804- TW194 17100	
Sample Date/Time:	4/6/98	
Sample Collected From	n: bothwoom tap left of kitch	hen
Comments:	· (looking of ki	this)
		_
population	4	· Ø
/ /		

Resident Name:	O'Neil
Address:	4 Swan Place
Mailing Address:	
Treatment Type (if ap	System: Soffener System: System F
Location of Treatment	System: Dasein en T
Sample No.	SGC-9804- Twi95
	4/6/98 17:50 n: Kitchen tays.
Sample Collected Fror	n: Kitchen tays.
Comments:	
······································	
population	4
1	

Resident Name:	Weschke	
Address:	2 Wood cutters	Path
Mailing Address:		
Treatment Type (if a	pplicable): MICVOIMET	
Location of Treatmen	t System:	
Sample No.	SGC-9804- TW196	
Sample Date/Time:	4/6/98 18:25	
Sample Collected Fro		
Comments:		
		\overline{Q}
sep 3		
•	000177 Databa	se Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Hagenberger
Address:	15 Quail Path RFDZ
Mailing Address:	15 Quail Path RFD2
Treatment Type (if a	pplicable): Sediment contribe at System: Disement
Sample No.	SGC-9804- Tw 197
Sample Date/Time:	4/7/98 12:15
Sample Collected Fro	m: takkroom senk behind Kitchen
Comments:	
Gediment	cartridge removed for sample
-	
	M(M)

Populat	$\frac{1}{2}$

Resident Name:	Green blatt
Address:	16 Teal Way
Mailing Address:	
Treatment Type (if ap	
Location of Treatmen	/
Sample No.	SGC-9804- 7W198 12150
Sample Date/Time:	
Sample Collected Fro	m: Utility Sink housement
Comments:	
Gedinent	contridges not by possed for sample
	MI/MSD
1002/4/10n	9nn
1 Maria I	000179 Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Kreusling
Address:	21 Teal Way
Mailing Address:	
Treatment Type (if ap	System: Dysly 4T
Location of Treatment	System: Desemat
	SGC-9804- TW199
Sample Date/Time:	4/7/98 100m 13:05
Sample Collected Fron	17/98 1000 13:05 10 bothwoon top left of Kitchen (looking at Kitchen)
Comments:	(Icroffing 97 Mitchile)
	MSTMJD
population	3
7	

000180

\supset_{\cup}	120
	y . –

RESIDENTIAL SAMPLE LOG

Resident Name:	Citrangola
Address:	3 Water cuest Ct
Mailing Address:	
Treatment Type (if ap	plicable): <u>Carpon (2 units)</u> + 50ffen
Location of Treatment	System: 1095ement
Sample No.	SGC-9804- TW200 TW20(
Sample Date/Time:	4798 13.50
Sample Collected Fron	
Comments:	all treatment
	DIM
,	

000181

RESIDENTIAL SAMPLE LOG

Resident Name:	Lee
Address:	248 Laurel Hill Path
Mailing Address:	
Treatment Type (if app	plicable): <u>Section Custored</u>
Location of Treatment	System: hasement
Sample No.	SGC-9804- TW202 14:30
Sample Date/Time:	4/7/98 14:30
Sample Collected From	bishroom tap next to Kitchen
Comments:	<u>'</u>
<u>Curtridge</u>	filter off-line
prefiulation	3 M

000182

			· · · · · · · · · · · · · · · · · · ·	
7	hood a	Hers 1	Path	
plicable):	culling	un SA	ferer	
SGC-9804-	TWZ	03	16:0	0
4/7/9	8			1
n: bothe	room tay	o(next	f to k	tr hen
	<u> </u>			<u></u>
b/pesse	d for	San	ysle.	
3			9	M
	000183		Database E	ntry:
	plicable): System: SGC-9804- 4//7/9 n: 20//4	plicable): Culling. System: Dassem. SGC-9804- TW2. 4//7/98 n: Dollwoom Tay.	plicable): Culligan Sort System: Lasemen F SGC-9804- TW203 4/7/98 1: Lothroom tays (next)	plicable): Culligan Softener System: tassement SGC-9804- TW203 /6:00 4/7/98 n: tothroom taps (next to fi

Resident Name:	Brady	
Address:	21 Brida/	-
Mailing Address:		
Treatment Type (if ap		
Location of Treatmen		
Sample No.	SGC-9804- 1 W Z O G	
Sample Date/Time:	4/7/98 (6:25	
Sample Collected From	SGC-9804- TWZOY 4/7/98 16:25 m: Slock in kgthroom left of Kitche	≥ 1
Comments		
sediment .	filter not bypassed	
Jepul atti	cn \$2,	
	000184 Database Entry:	

RESIDENTIAL SAMPLE LOG

Resident Name: Arane O	
Address: 43C Woodcrest	
Mailing Address:	
Treatment Type (if applicable): Sediment cartroge	
Location of Treatment System:	
Sample No. <u>SGC-9804-</u> 7 W 2 C 5	
Sample Date/Time: 4/7/98 /6:40	
Sample Collected From: bothroom tay by front do	ez
Comments:	
filters not bypassed for sample	
pepulaton 4	
000185 Database Entry:	

Resident Name:	Bonura
Address: _	Bonurg 5 Quail Pak
- Mailing Address: _	
Treatment Type (if app	System: Kone
Location of Treatment	
Sample No.	SGC-9804- TW206
Sample Date/Time: _	5GC-9804- TW206 4/7/98 17'00
Sample Collected From	
Comments:	
pepulati	Mu 2
1-1,2000	

RESIDENTIAL SAMPLE LOG

Resident Name:	Edwards	MUSU	Meci
Address:	25 Harbon		·
·	Rental Unit	- Post Fr	140
Mailing Address:	Rental address	s P.O.	Box 57
		5+ Ja	nes 1178
Treatment Type (if a	pplicable): <u>Cav k</u>	1 70 m	
Location of Treatmen	nt System: <u>Da Sen</u>	nent	
Sample No.	SGC-9804- TW2C	37 18	:30
Sample Date/Time:	4/7/98	18	2:30
Sample Collected Fro		w /Kitche	9
Comments:	Post Rilter	-	
			·
gob.'		@	
	000107		

000187

RESIDENTIAL SAMPLE LOG

Resident Name: Mr. Bernardini
Address: 37 Spring hollow ROAD. NISSE QUOQUE.
Mailing Address: P.C. 130x 2217 ST, JAMES, N.Y. 11780
Treatment Type (if applicable): Location of Treatment System:
Sample No. SGC-9804- 7-0208
Sample Date/Time: 4/8/98 /3:30
Sample Collected From: Tops before filter in besenred
Comments:
Withen try cloqued upon value
closure of filter
filter appears to be R.O. but may
filter affears to be R.O. but may be carbon that has never been changed. Deputation 1
Developen 1

000188



RESIDENTIAL SAMPLE LOG

Resident Name:	Harkin
Address:	28 Moriches Rd
Mailing Address:	
Treatment Type (if a	pplicable): Sediment (Carbon (?) at System: tosement (near boiler)
Location of Treatmen	t System: basement (near boiler)
Sample No.	SGC-9804- 7WZ09 TWZ10
Sample Date/Time:	4/0/98 14:45
Sample Collected Fro	
Comments:	·
filters	hypassed for sample.
population	22 29m
	000189 Database Entry:

	RESIDENTIAL SAMPLE LOG
Resident Name:	Schrift owner Mc Dowell Rost
Address:	17 Teal Way
Mailing Address:	also mail results to Gwner Bocc Raton FL
Treatment Type (if ap	plicable): Abne
Location of Treatment	System:
Sample No.	SGC-9804- TW211
Sample Date/Time:	4/8/98 16-10
Sample Collected Fron	n: buthown tap left of Kitchen
Comments:	(looking (a) Kitchen)
ma;/ V	esults to both addresses
population ?	9m,
The state of the s	

000190

MSMSD

SMITHTOWN GROUNDWATER CONTAMINATION

Resident Name:	Zecchine
Address:	20 Teg/ Way
Mailing Address:	
Treatment Type (if ap	
Location of Treatment	•
Sample No.	SGC-9804- TW 212 MGMOV
Sample Date/Time:	16:20 m: Kitchen Tays
Sample Collected From	n: Kitchen Tago
Comments:	
filter pe	ot to passod for sample
population	5
<i>y</i> /	

1 \	heen Draper
Address:	9 Partroge Lu
Mailing Address:	
Treatment Type (if ap	plicable):
Location of Treatment	System:
Sample No.	SGC-9804- TW 213
Sample Date/Time:	4/8/90 16:50
Sample Collected Fron	n: Kitchen tap
Comments:	
~	
populations	3 Olm
/ /	

RESIDENTIAL SAMPLE LOG

Resident Name:
23 5 11/2 10
Address: Dring Pollow &
Mailing Address:
Freatment Type (if applicable):
ocation of Treatment System:
Sample No. SGC-9804- TW214
Sample Date/Time: $4/8/98$ 17.10
ample Collected From: Kitchen tags
Comments:
sepulation 2 DM

000193

RESIDENTIAL SAMPLE LOG

Resident Name:	Lederer
Address:	16 Three Sisters Rd.
Mailing Address:	—Same —
Treatment Type (if ap	n L
Sample No.	SGC-9804- TW215
	1.19198 / 7105
Sample Collected Fro	m: Kitchen Sink
Comments:	Byparsed the treatment Bystem (micromat)
before la	m: Kitchen Sink Byparsed the freatment Bystem (micromat) isample was collected.
Control of the Contro	
Population	\$ (+1) 4.
1	

000194

RESIDENTIAL SAMPLE LOG

Resident Name:	Windels
Address:	34A Springhollow Rol (Harbor House)
Mailing Address:	
8	P.O. Box 199 St Sames 11780
Treatment Type (if a	pplicable):
Location of Treatmen	t System:
Sample No.	SGC-9804- TW216
Sample Date/Time:	4/9/98 1240
Sample Collected Fro	m: Kitchen tap
Comments:	<u>· </u>
pepulation	12
17-14	

fortal 1

SMITHTOWN GROUNDWATER CONTAMINATION

Resident Name:	Windels - Owner	
Address:	34 A Springhollow Rd	
Mailing Address:	P.O. Box 199 owner St James	
Treatment Type (if ap	plicable): λ mQ,	
Location of Treatment	System:	
Sample No.	SGC-9804- W2/7	
	4/9/98 12:00	
Sample Collected From	and the second of the second o	
Comments:		
well fank.	+ water lines visible from outside- No treat	men
sample fr	om brown shingked Louse	
gearest Ha	rbor House Cleft front	
of Harbo	y how House (left front y House looking at Harbor House),	
pen?	3	_
Herber	when House	
	Database Entry: Limitation	
to I house]	000196	

Resident Name:	Vanderbaan	(Rentus)	windels(owny)
Address:			HollowRd
Mailing Address:	Nissequague Same	. 11780	
Treatment Type (if ap		toreut m	· · · · · · · · · · · · · · · · · · ·
Location of Treatment	System:		
Sample No.	SGC-9804- TW218	No. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10	· · · · · · · · · · · · · · · · · · ·
Sample Date/Time:	4/9/98	1300	
Sample Collected Fror	n: <u>Kitchen Si</u>	nk.	
Comments:	Zenta	This Sam	1
	Renta	. —	tarbor house
	Dark		
	lontai		
Pop: Fultin	4 2, ad 3	Kids	(F)
	00019	D i	atabase Entry:

	RESIDENTIA	L SAMPLE	LOG	bas	_
Resident Name: _	34A	Spin	y Holl	ow let	Windels
Address:		Spring Ogle		RJ 11780	
Mailing Address: _					
Treatment Type (if appl	licable):	None			
Location of Treatment S	System:				
Sample No. S	GC-9804-TW2	19			
Sample Date/Time: _	4/9/98		FW	1315 km	2
Sample Collected From:	outside	Spigo			
Comments:					
<u>Reside</u>	nts not-	at	home	-	
House over	the goras	Q . (Vande	v baaru)	harbor	
	0 2		19	\rightarrow	
-10	IS P	rental3		Her bo	V Lowner
Sa	mille ter			Hous	r Lowner
——————————————————————————————————————	ample feel senter s				
Rev	-rentar	7			
	Willia	ams ter 4)		The second	
	000j		<u>Data</u>	base Entry:	
	U U U ,	T 7 0			

Deplicate

SMITHTOWN GROUNDWATER CONTAMINATION

Resident Name:	Spielberg	
Address:	249 Laurel Hill Path	•
Mailing Address:	P.O. Box 374 St James Ny 11780	
Treatment Type (if app	plicable): Soffener + micromet	
Location of Treatment	System: Disement	
Sample No.	SGC-9804-TW 220 TW 221	Dey
		1410
Sample Collected From	Kitchen tays	
Comments:		
treatment	t not hypersed for sample	
pys y		
+/		/



Resident Name: Mr. Einsfeld
Address: 254 Stangerte
Mailing Address:
Treatment Type (if applicable):
Location of Treatment System:
Sample No. SGC-9804- TWZZZ
Sample Date/Time: 4/9/98 14.20
Sample Date/Time: 4/9/98 14:20 Sample Collected From: +cyp y Willity voem next to Kita
Comments:
pepalotsen:

RESIDENTIAL SAMPLE LOG

Resident Name:	Ryan
Address:	254/4 Gld Post Ln
Mailing Address:	
Treatment Type (if app	plicable): Vone
Location of Treatment	System:
Sample No.	SGC-9804- TWZ3
Sample Date/Time:	15'46
Sample Collected From	: thity tap (it.lity room next to
Comments:	Kitchen /
ser a	
∜	

X

000201

Resident Name: Mi	s. Davis +M. Box
Address:	255 CW Post Ln
Mailing Address:	
Treatment Type (if a	oplicable):
Location of Treatmen	t System:
Sample Date/Time:	SGC-9804- 7W ZZY 4/9/98 +3:55 1555 m: Kirtchentap (tap located on 15 kmc
Sample Collected Fro	m: Kitchentup (tapo located on 15 lance
Comments:	
,	
Dollati	m L

Resident Name:	Treder
Address:	10 Partridge Ln
Mailing Address:	
Treatment Type (if ap	eplicable): Sediment curtilder System: basement
Location of Treatment	System: <u>basement</u>
Sample No.	SGC-9804- 225
Sample Date/Time:	4/13/98 13:30
Sample Collected From	n: Kitchen tap
Comments:	
Sediment	filter not 12 passed for somple
pepulation	2
1 1	

RESIDENTIAL SAMPLE LOG

Resident Name: Magaio	_
Address: 11 Watercoast	
Mailing Address:	
Treatment Type (if applicable): Sediment Cartridge Location of Treatment System: basement	
Location of Treatment System: <u>basement</u>	
•	
Sample Date/Time: 4//3/98 14:00	
Sample No. SGC-9804- TW276 Sample Date/Time: 4/13/98 14:00 Sample Collected From: Bathroon tays next to Kitchen to	_
Comments:	
Sedwent contridue not hipsped	
For sample (volve problem)	_
population 5	
	_

000204

RESIDENTIAL SAMPLE LOG

Resident Name:	Kopf	•
Address:	45 Worderest	-
Mailing Address:		
Treatment Type (if a	applicable): Sediment cartuidge (?)	
Location of Treatme	nt System: <u>hasemen +</u>	
	SGC-9804- TWZZZ	
Sample Date/Time:	4/13/98 14:40	
Sample Collected Fro	om: Kitchentage (tap right of tr	1
Comments:		•
Gediment c	cartride not supessed for somble	
	21	
population	:2	
<i>V</i> •		

Resident Name:	Milburn
Address:	4 Woodentters
Mailing Address:	
Treatment Type (if ap	<u></u>
	333 2001 TUIS 7 G
Sample Date/Time:	4/13/98 15:00 n: What byth vom sink (loft of Kitchen)
Sample Collected From	n: Wholey Sythiom sink (loft of
Comments:	Kitchen
filter N	or tappassed for sample,
pepulation	4
/ /	,

Resident Name:	Mc Enane-1
Address:	Mc Enane-1 199A River Rd
Mailing Address:	P.C. Box 444 Sinithtown 11787
	Smithtound 11+0+
Treatment Type (if ap	plicable): Mone
Location of Treatment	System:
Sample No.	SGC-9804- TW 229
Sample Date/Time:	15:35 n: 11tches tap.
Sample Collected Fron	n: Kitchen tays.
Comments:	,
	(\mathcal{R})
populat	in 6 3

Resident Name: Setran
Address: /7 Froe hollow
Mailing Address:
Treatment Type (if applicable): <u>earbon</u> <u>Sofferer</u>
Location of Treatment System: besement
Sample No. SGC-9804- TWZ3C
Sample Date/Time: 24/13/98 16:40 Sample Collected From: Ketelen fay
Sample Collected From: Ketchen fay
Cartan typessed for sample. (Valves)
(Valves)
pepulaten 2
000208 Database Entry:

Resident Name:	Weinstein
Address:	9 Bridal Path
Mailing Address:	176 Second Street St. James, NY 11780
Treatment Type (if ap	plicable): Chemical Toront may be softened System: Basement
Location of Treatment	System: Basement
Sample No.	SGC-9804- 231
Sample Date/Time:	4(14/98 1305
Sample Collected Fron	n: Bethroom Faucet
Comments:	Troutment system By-Passed
Population:	2

Resident Name:	Penney	
Address:	Penney 43 Morrelies Rol	
Mailing Address:		
Treatment Type (if ap	plicable):	
Location of Treatment	System:	
Sample No.	SGC-9804-7V2 3 Z	
Sample Date/Time:	4-14-98 (3:10	
Sample Collected From	4-14-98 (3:10 Kitchen tags	
Comments:		
		_
		_
		_
Deplat		
1-1-141		_ 7

Resident Name:	Nonhsiung	Charg	· · · · · ·
Address:	7 Wed	tercrest Court	78 ^U
Mailing Address:			
Treatment Type (if ap	oplicable): Sediment	Filtu	
Location of Treatment	pplicable): System: Sodiment Beleine	nt	
Sample No.	SGC-9804-7W233		TW 234 P
Sample Date/Time:	4/14/98 1320)	1330
Sample Collected From	n: <u>Kitden Fa</u>	recet	
Comments:	Sediment fil	ter by passed	
			
	······································		
	**************************************	@	<u>'</u>
Pop: 3			
	000211	<u>Database En</u>	atry:

Resident Name:	Marsic	cueterg
Address:	262B	Old Mill Rd
Mailing Address:	Same.	
Treatment Type (if ap	1 100	(Softener Not in Use)
Location of Treatment	System.	7 4 5
Sample No.	SGC-9804- TW 23	55
Sample Date/Time:	4/14/98	14.65
Sample Collected From	n: bathroun	tap
Comments:		
1 april 1 to	2	
population	U	
	000212	Database Entry:

Resident Name:	Rockwell
Address: 4	Rockwell 3R Woodcrest (primary residence)
Mailing Address:	C PSP (Mary V. ESTOCHTE)
Treatment Type (if applica	ble): None
Location of Treatment Sys	rem:
Sample No. SGC	C-9804-TW 236
Sample Date/Time:	114/98 15:15
Sample Collected From:	Kitchen Sink
Comments:	
	(well ~ 150 f4)
population	, * /

RESIDENTIAL SAMPLE LOG

Resident Name: Mu Stichler (Raste)
Resident Name: Mu Stichler (Raster) Address: 43 B Wood crest (rental of 43R)
Mailing Address:
Treatment Type (if applicable):
Location of Treatment System:
Sample No. SGC-9804- TW 25-
Sample Date/Time: U1498 15:40
Sample Collected From: Kitchen tae)
Comments:
Redulestion of
perulation d
Database Entry:

000214

/

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	Affics	
Address:	203 Steeptank	
Mailing Address:		
Treatment Type (if a	1	
Location of Treatmer	nt System:	
Sample No.	SGC-9804-7W Z 38	
Sample Date/Time:	4/14/98 16:00	
Sample Collected Fro	om: ballwoom tap (left of Kit	-le
Comments:		
pepulation		1
1		<i>/</i> ·

Resident Name: 505	eph Rubio
,	1964 River Rd
— Mailing Address:	
	· · · · · · · · · · · · · · · · · · ·
Treatment Type (if appl	eystem: Colligan softener basement
Location of Treatment S	ystem: [Jasemy]
Sample No. Se	GC-9804- TWZ39
Sample Date/Time:	16:30 Kitchen tajo (main level)
Sample Collected From:	Kitchen tajo (Mgin level)
Comments:	
Cullican o	ff-line
population "	2
V /	000216 Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Slack	Cow	ner)		
Address:	Slack Meconi 194	i (re	nter) Rel		
. Xuui 035.			7		
Mailing Address:			1787/1-81		
Treatment Type (if app	olicable): _	None	Colle	egan So	Atene
Location of Treatment	System: _	pase	me.t		
Sample No.	SGC-9804- T	w 240)		
Sample Date/Time:	4114(9	8	1655		
Sample Collected From	n: K/7	telren	tap.		
Comments:					
			- 11 - 11 - 11		
		1		(a)	
populex	for: 7	>			

000217

Resident Name:	Teurs
Address:	3 Patridge Lane
	11780
	,
Mailing Address:	PO BOX 477
	ST JANES 11780
Treatment Type (if ap	plicable): NONE System: N/A
Location of Treatment	System: N/A
Sample No.	SGC-9804- 24 (
	4/15/98 / 12:30
	n: tirchen TAP
	1. 10.16.000
Comments:	
Pop: 4 -	ts

Resident Name:	An	THONY	marchello	•
		,		
Address:	12	QUA'I PA	tth -	
			11780	
		,		
Mailing Address:	spre	AS ABore		
Treatment Type (if ap	plicable):	None		
Location of Treatment	System:	N/A		
Sample No.	SGC-9804- T	W 242		
Sample Date/Time:				
Sample Collected From	n: <u>,r—</u>	17 har	A	
Comments:				
	····			
Pop: 4				(2)
V-01.				

RESIDENTIAL SAMPLE LOG

Resident Name:	Nelly SANTIAGO
Address:	262 M OID MIT ROAD Misserveque 11780
Mailing Address:	SAL AS ABOR
Treatment Type (if ap	A 1 / A
	SGC-9804- TW 243
-	4/15/98 1320
Sample Collected From	m: Kitchi TAP
Comments	
POP: 6	. @
•	

000220



Resident Name:	JUDITH L	OCK
Address:	35 W 500%	6 HOHOW RD
	Nisse quoque	11780
Mailing Address:	SAME AS ABOU	
Treatment Type (if ap	plicable): None	
Location of Treatment	System: <u>ペ/人</u>	
Sample No.	SGC-9804- TW 244	
Sample Date/Time:	4/15/98 140	
	n: Don NSTAIRS	
Comments:		
<u>, </u>		
Pop: 2		
,	000221	Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Vincent Youerri
Address:	1894 RUER RD. N'SSE 9-09-11780
Mailing Address:	ST JAMES 11780
Treatment Type (if ap	pplicable): Sofma
	SGC-9804- TW 2 45
-	41.5/98 1420
Sample Collected Fro	m: OUTSIDE TRP
Comments:	Sef THER COSED NOT BE BY PASSED
Se 00-50	De TAD (NOT TICKED) WAS USED
ROP: 4	

000222

RESIDENTIAL SAMPLE LOG

Resident Name:	Russ Perry
Address:	196 River ROAD
	N'ssequeque 11780
Mailing Address:	same as ABoue
Treatment Type (if ap	plicable): NONE
Location of Treatment	System: N/A
Sample No. Sample Date/Time:	SGC-9804- TW 246 4/15/98 1440
-	n: 00-500 SP GOT
Comments:	
Pop: 1	~@

000223

RESIDENTIAL SAMPLE LOG

Resident Name:	Thomas J. Frawley TR.
Address:	31 Highmoods (cont 57 JAMES 11780
Mailing Address:	SAME AS ABOVE
	plicable): 2 Co Corson Cy (100)
	System: BAServi
Sample No.	SGC-9804- TW 247 and TW 248
Sample Date/Time	4/15/98 1515 and 1520
Sample Collected From	m: Tway7 - 16 ides top (read water) Pest +w 248 - 62-5100 58:60- (Pic Treatment)
	By pass System, - Took Pletter
LATER From	out sise spect.
Deb: P	(3 CL 1) [CN)
	Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Rosemary CAGGOII	
Address:	210 River RD.	
	210 River RD. Nissequaque 11780	
Mailing Address:	same As ABOJE	
Treatment Type (if ap	pplicable): PGN-OF UH ON KTELN SLUK -SCAGUIY I mich	`c) /
Location of Treatment	System: Krelen	Ο,
Sample No.	SGC-9804- TW 248	
Sample Date/Time:	4/15/98 1610	
Sample Collected From	m: BAC Sinx	
Comments:		
·		
Popy 1	(2 CLI DSEN)	

Resident Name:	Frank Bruno
Address:	191 C River RUAD
	Nisseque 11780
Mailing Address:	Same As ABOLE
Treatment Type (if ap	plicable): No re
	A) / A
Location of Treatment	
Sample No.	SGC-9804- TW 250
Sample Date/Time:	4/5/98 1310
Sample Collected Fron	1: Krchen TAD
Comments:	ROCKUT PRIVATE LAB SANDIE
Conected	2/16/98 - ND.
Population	2

Resident Name:	Jennier Drucker
Address:	270 Sachen him Place
	57 James 11780
Mailing Address:	Same as Asour
Treatment Type (if ap	plicable): 2 Co ft carbon
Location of Treatment	System: Brick Room on 10-ch level post SGC-9804- TW 251 AND SGC-9804- Tw 25
Sample No.	SGC-9804- TW 251 AND SGC-9804- TW 25
	4/5/98 1335 AND 1345
Sample Collected From	n: <u> </u>
Comments:	FIRST SAMPLENIS AD TERROSS STORIES
Toww win	COEBON TITEL BYPASSEL. SECOND : 5
freared ha	TOR (TURSA)
Population	<u>~</u>
	· · · · · · · · · · · · · · · · · · ·

RESIDENTIAL SAMPLE LOG

Resident Name:	~ AεΚ	JASNOW
Address:		DNII RO
Mailing Address:	2637 GID	MII RD.
	N. SCTLOGUE	11786
Treatment Type (if a	pplicable): $\frac{C \land 2 \land 3 \land N}{P \land P \land Q \land N}$	- 1 CYINDER ON Whole house
Location of Treatmer	nt System: (ARCHES)	N BOSENT ROLLINGS WITH STATE COND TW 25 14
Sample No.	SGC-9804- TW 253	and TW254
Sample Date/Time:	4/5/98 1410	D470 CM
Sample Collected Fro	om: 1= row 7 AP1	TW2(3) + GUTSING SPICET (TW2
Comments:	CARBON FITTER	in Baseria Treats Whele
house Ro	s under since	Mais scenies Sink TAP
Cursine	SPIGOT IS BEE	- ore conson times + Ro.
Pap: 3 (10	Jai (20)	
1 - 1 - 1 - 1		

RESIDENTIAL SAMPLE LOG

Resident Name:	KAThleen T. GRANT
Address:	262A OID MII RD.
	Nissequeque 11780
Mailing Address:	Same AS Agove
Treatment Time (if on	plicable): WATER SOFTWER + SED FITTE
	System: BASent
Sample No.	SGC-9804- TW 255
Sample Date/Time:	4/5/98 1445
Sample Collected From	n: Barnsoon Too (Domostales
Comments:	
100	
POP3 (

<u>Database Entry:</u>

/

SMITHTOWN GROUNDWATER CONTAMINATION

Resident Name:	Diane + ANDrew Kastain
Address:	248A lawel Hill PATH
	Nissequeque 11780
Mailing Address:	Spre AS ABOUT
J	
Treatment Type (if ap	plicable): NONE
	System: N/A
-	SGC-9804- † い えらら
Sample Date/Time:	4/5/98 1515
Sample Collected From	m: Kitchen Sink
Comments:	
<u> </u>	
Pop 4 (2	(W) D(2)

RESIDENTIAL SAMPLE LOG

Resident Name:	Keu'N BAIFE
Address:	250 164771 Hin PATH
Mailing Address:	Same AS ABOUT PIUS RED#2
Treatment Type (if ap	AL I A
Location of Treatment	System: N/A
_	SGC-9804- TW み57
Sample Date/Time:	4/5/98 1540
Sample Collected Fror	n: (Circles tap
Comments:	RECENTLY SAWIED By DUIVATE LAB
-ND.	
P02:4	(zchinoren)

Resident Name:		RON	GASPER	
Address:	227	Stone (SATE	
	Nissec	1009VE	11780	
Mailing Address:	SA~	AS A.30	Ve	
Treatment Type (if ap		NONE		
Location of Treatment	System:	N/A		
Sample No.	SGC-9804-	m 358		·-··
Sample Date/Time:	4/5/98	1600		·
Sample Collected Fron	n: <u>Da</u>	NSTAVES BATT	war Tap	
Comments:				
Pop: 3 (1	(L'D)	W		(A)

/

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	BATBATA STATE
Address:	3 TIDE MIN ROAD STJAMES 11780
Mailing Address:	Same AS ABOVE
	plicable): WATER SOFTNER
Location of Treatment	System: Baccom
Sample No.	SGC-9804- TU 259
Sample Date/Time:	4/5/98 1630
Sample Collected From	1: Kitch TAP
Comments:	WATER SORTHER WAS BYPATER FOR
Sarling	•
POP: 3 (1(110)

000233

Resident Name:	MARGUERITE TASTAN
Address:	4 QUAIL PATH Nissequoque 11780
Mailing Address:	SALE AS ABOUC
	plicable): Seomen Frires (carrerisse) System: BAS men
	SGC-9804-250
Sample Date/Time:	4/5/98 1705
Sample Collected From	m: Kircles Tap
Comments:	
•	
	*
Pap: 6 (2 CC105cm)

RESIDENTIAL SAMPLE LOG

Resident Name:	Richard DolCE
	11 Quair Path
	nisse Gronger 11786
Mailing Address:	SAME AS AGOVE
Treatment Type (if ap	plicable): SANO FITCE
Location of Treatment	System: Basen
Sample No.	SGC-9804-TW261
Sample Date/Time:	4/5/98 17:30
Sample Collected From	n: Donnsmes Banroon
Comments:	
POP: 2	

000235

Resident Name:	Felicia + Ravald Somers
Address:	19 TEAL WAY NISSERIOSIE 11780
Mailing Address:	SAM AS PROJE
Treatment Type (if ap	oplicable): Micro Me T
Location of Treatmen	t System: BASENT/Well
Sample No.	SGC-9804- Twaba
Sample Date/Time:	4/5/98 1755
Sample Collected Fro	m: 1570CW TAP.
Comments:	
<u> </u>	
	6
Pop: 2	

Resident Name:	Michael Mikulewich
	22 TCAL WAY N'. SSCYLOGE 11786
Mailing Address:	\$ Same AS ABOUR
•	System: Soltack + Ro
Sample No.	SGC-9804- TW 263
	4/5/98 1825
_	1: Duna States Barron TAP
	20. Feel 5 J.ST The Right Tol
	AS By PASSED FOR SANDINY
<u> </u>	
	•
Pop: 7 (4	Cr., 101m)

Resident Name:	RICLATIO URBAN
Address:	24 TEAL WAY NISSEGUOGLE 11)80
Mailing Address:	5 Anc DS ABOUR
•	oplicable): CARAON CASTESTINGE FINTER t System: 30 sent
Sample No.	SGC-9804- TW 264
Sample Date/Time:	4/5/98 1840
Sample Collected Fro	m: 6075:00 50 607
Comments:	INSIDE NOT EASY TO BYPASS FILTER
	*
2.0:5	(3chipsen)



Resident Name:	FIGENC ROM
Address:	NISSEGUIJUE 11780
	Nissequique 11780 Sam As Above
Treatment Type (if ap	plicable): <u>Sesimer carachye re'ree</u>
Location of Treatment	System: BA Security SGC-9804- + W 265
Sample No.	SGC-9804- +W 265
Sample Date/Time:	45/98 19:00 BASENT ASINK
Sample Collected From	n: BASeret ASINK
Comments:	
Pop: 5 (3 chiloren)

Resident Name:	Richard + Diane CATUILO
Address:	245A 010 mil
	N. SSEGUOGUE 11780
Mailing Address:	SAVE AS A-BO-R
Treatment Type (if ap	plicable): Newe
Location of Treatment	System: N/A
Sample No.	SGC-9804- TW 266
	4/5/98 1925
Sample Collected Fron	n: Lamby Rown 5:nx TAP
Comments:	
Pop:2	

Resident Name:	N'NA MASDEN	
Address:	192 River RD. Nissequoque 11780	
Mailing Address:	SAME AS ABOUR	
Treatment Type (if ap	·	
Location of Treatment	System: N/A	
Sample No.	SGC-9804- IW267	
Sample Date/Time:	4/5/98 1205	
	m: Kitchen TAD	
Comments:		
		<u> </u>
		<u> </u>
Pop: 2		~ (P)

Resident Name:	CII: OTT GIASS	
Address:	1924 River RD.	
	N:550 9:09:00 11786	
Mailing Address:	Same As Agose	
Treatment Type (if ap	pplicable): Noゃe	
Location of Treatment		
Sample No.	SGC-9804- TW 268	(
Sample Date/Time:	4/6/98 1250	
Sample Collected From	m: Ktchen TAP	
Comments:	Sample By SCHD 10/23/97-	CN
	*	
POP: 2		i

RESIDENTIAL SAMPLE LOG

Resident Name:	Jean	iette	MUJRIS	2 9 9
Address:	2073	Rive	ROAD	
	Nisseq	00900	11780	
Mailing Address:	Same 12	is About		
Treatment Type (if ap	plicable):	ARBON Fil	TCR (200	F T)
Location of Treatment	System:	Aser	POSY	
Sample No.	SGC-9804- † ₩ 3	269 Ar	-0 Tw3	270
Sample Date/Time:	4/6/98	1340	135	· С
Sample Collected From	n: <u>Ki-cie</u>) and 1	3074)	
Comments:	TW269	is win	1 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	ByBASSEN
() Alexand	law water) 200	TW 270	S A FITO
CARBON F	170R (No. 7 (3 y PA 5 5-es)		
·				
Noir: (ou	~ T y DATA - 12	129/97	1 PP 13	
61:2	are Gondan y	2/11/18	18.4 880	PCIE
		4		
Pop: 5	(2 chi)	ren)		
. ,		/		

RESIDENTIAL SAMPLE LOG

Resident Name:	AIVEN HeIR
Address:	3 Tide Mill LANC ST JAMES 11780
Mailing Address:	SAME AS 930-E
Treatment Type (if a	
Location of Treatmen	SGC-9804- WA7 (and TW272
Sample Date/Time:	4/6/98 1450 MD 1500
Sample Collected Fro	m: Kitalan Sind
Comments:	TW271 COLICETED WIN CARBON FITTER
	I TW272 WITH TO FITTE : NINE.
Scho Sant	DIE 12/30/97 - GRB PCE
Par 2	<u>(57)</u>
1	

RESIDENTIAL SAMPLE LOG

Resident Name:	ELio MADAMA
Address:	1 HARBOR LANC
Mailing Address:	Strames 11780 Sprie As ABOVE
Treatment Type (if ap Location of Treatment	plicable): ncpo mi
Sample No.	SGC-9804- 273
Sample Date/Time:	4/6/98 1515
Sample Collected From	n: BASISOOM SINK TAR - MIDDLE LEUL.
Comments:	
	*
POP: 3	

Database Entry:



RESIDENTIAL SAMPLE LOG

Resident Name:	ROBERT Successey
Address:	2 Tide mill Roads
Mailing Address:	Sam As ABove
Treatment Type (if a	Deplus in the
Location of Treatmen	t System: BASCULT Pre
Sample No.	SGC-9804- TW274 al TW275
	4/6/98 1840 and 1550 DOWNSTONS DAMSON (TW 274) AND PSCSSWE TON
Sample Collected Fro	> l. 6c 7 (Tu
Comments:	CARBON unit NOT EASILY BYPASSON
- Pre -reas	ent SAMPLE concerd From Signat of
Pressure	TANK IN BADEMER (TW 275)
	4
Pop: 4 (2 (L'10164)
•	

RESIDENTIAL SAMPLE LOG

Resident Name:	Rubert Weish
Address:	199 River RD
-	ST JAMES 11780
Mailing Address:	SAME AS ABOVE
Treatment Type (if app	System: Carrer Oge scommer Files Carrer Oge scommer Files
Location of Treatment	System: Garage / punt room
Sample No.	SGC-9804- Tw 276
Sample Date/Time:	4/6/98 1650
Sample Collected From	ii Kitchen Strak
Comments:	
Pop: 2	CA.

Resident Name:	Coleen RYAN	
Address:	12 MARBOS LANC	
	ST JAMES 11780	
Mailing Address:	PO BOX 361	
	ST JAMES 11780	
Treatment Type (if ap	oplicable): No N C	
Location of Treatmen		
-	SGC-9804- TW277 + TW278 (UUPI)	Ai
Sample Date/Time:	4/7/9 1150 AND 1155	
Sample Collected Fro	m: Down STAIRS	
Comments:		
	•	_
Pos: 4 (2 (L', D.C.,)	.❸



Resident Name:	ARDOIPHUS LaRoche	
Address:	10 HARBET LANG ST JAMES 11780	
Mailing Address:	GAME AS ABOUR	
Treatment Type (if ap		
Location of Treatment		
Sample No.	SGC-9804- TV 279	
Sample Date/Time:	4/7/98 1215	
Sample Collected From	n: Kirchen TAD	
Comments:		
		٠
GOP: 2		

Resident Name: DR MASTIN HOUDTMAN
Address: 1780.
Mailing Address: SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
Treatment Type (if applicable): 2 CL FT CARROW 2 SYLLMENS Location of Treatment System: 3 ASERTE
Sample No. $\frac{\text{SGC-9804-} + \text{W280}}{\text{(pre)}} = 3000000000000000000000000000000000000$
Sample Collected From: Kitzlen TAP
Comments: TN280 (cited the Sister was B=Passel (Raw naver) Tw281 conected white System was in Line (preced water)
Private Sansie of RAN WATER COLLECTED ON 2/25/98 - 2.3 PFB PCE
PCP; 2
* telecon with Dave losoff - 4/28/98 - 100 ohrs. Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Valerie TAriGO.
Address:	337 River ROAD
	5.T. JAMES 11780
Mailing Address:	SAR AS ABOVE
	(Alma)
Treatment Type (if ap	oplicable): 2CU CAMBON FITCR AND CAMERIOS
Location of Treatment	System: BASCOUT
Sample No.	SGC-9804- TW 282 AND TW 283
Sample Date/Time:	4/5/98 1385 AND 1405
Sample Collected From	m: BASener Sink
Comments:	TW 282 Concern win The corpor
Fire 13472	ssed and Tw283 was asserted with 17
in line.	
Pap: 2	

RESIDENTIAL SAMPLE LOG

Resident Name:	Jo C	FOLTUNATO	-
Address:		11780	-
Mailing Address:	Sanc As		-
Treatment Type (if ap	oplicable): <u>None</u> t System: <u>N/A</u>		-
Sample No.	SGC-9804- TW 284		_
Sample Date/Time:	4/6/99 143	2.5	-
Sample Collected From	m: Kircles Tr	÷ 6	_
Comments:			-
			-
			_
•			_
			_
<u> </u>		*	- Ø
Pop 1 2			_ X** -

000**2**52



Resident Name:	Ben ACD Nelson
Address:	247 STONE GATE ST JAMES 11780
Mailing Address:	RFD#2 BOX 247 STONEGATT NISSEQUOQUE (ST JAMES) 11780
Treatment Type (if ap	
Location of Treatment	System: N/A
Sample No.	SGC-9804- IN 285
Sample Date/Time:	4/6/48 1515
Sample Collected From	n: Kirchen TAP
Comments:	
	MS MD
	· · ·
POP: 2	

Resident Name:	CATLETINE THOMAS
Address:	247A STONEGATE
	Nissequoque 11780
Mailing Address:	200 42 C 2436 DO
	Rfg #2 247A STENEGATE
	······································
	oplicable): NONC
Location of Treatment	t System: N/Λ
Sample No.	SGC-9804- + ≈ 286
Sample Date/Time:	4/6/98 1540
Sample Collected From	m: Downstriks BANDOM TOP.
Comments:	
,	
	*
Ros 2	- A
401 ~	

RESIDENTIAL SAMPLE LOG

Resident Name:	Books Eise Locks
Address:	226 laurei Hill Path
	N.55e4.09-e 11780
Mailing Address:	Some As ABOLE
Treatment Type (if a	pplicable): 2 200 CASA CYLLARS + Columbia System: Basemant PR SGC-9804-TW 287 and TW 288
Location of Treatmen	System: Base April
Sample No.	SGC-9804-TW 287 and TW 288
	4/7/98 1600 AND 1610
Sample Collected Fro	m: BASENT BANCOON TAP
	TW-287 Collected with All Filteria
	By Bassed, TWZ88 Collected With
	on I've [Near Late)
	5T 3/13/95 -29013 PCIS
Private Test	_
Privite Tost	
	•
ROP: 5	(36 Linger)
2.1.	

000255

Resident Name:	Vincent Raminez
Address:	252A STONEGATE
	Nisservegue 11780
Mailing Address:	SAme As Asoul
Treatment Type (if ap	plicable): WATER SOFTMER
Location of Treatment	System: Baseman
Sample No.	SGC-9804-TW 289
Sample Date/Time:	4/9/98 1645
Sample Collected From	n: Jamosy Room sink TAP
Comments:	Softmer 377. Assed For SARIING.
	*
Per. 2	

RESIDENTIAL SAMPLE LOG

Resident Name:	Daisetstern Cinco
Address:	252C STONEGATE
	1000 ST JAMES 11780
Mailing Address:	Same AS ABOVE
Treatment Type (if a	pplicable): NONE O Prenty (Myon the Flores et
Location of Treatmer	pplicable): NONE OPERATY (ARGON UNIT DIANGLE) IN TO SYSTEM:
Sample No.	SGC-9804-TW 290.
Sample Date/Time:	4/7/98 1700
	m: Larrory Room Sink TAP
Comments:	BYPASSED LATTON System To Be Suff;
17 VAS NO	- Country, gecorny to be minent
	(B)
Pop. 4	(2 chinsen)

000257

RESIDENTIAL SAMPLE LOG

Resident Name:	Ellen Richian.
Address:	N. SSEGUOGUE 11780
Mailing Address:	Sime AS ABOUR.
Treatment Type (if ap	8 A —
	SGC-9804- Tw291
	4/7/98 1750
	m: BASING BATHOOM TAR
Comments:	Resignit over the FAL AND WOULD
WATEL SEE	Tree Bipassed FOR SAMPING
	*
Pog: 3	

Resident Name:	John Moore
Address:	1896 River ROAD
	Nissequegue en780
Mailing Address:	same as Asoul
·	
Treatment Type (if ap	
Location of Treatment	System: N/A
=	SGC-9804- Tw292
Sample Date/Time:	4/8/98 1310
Sample Collected From	n: Kirclen TAP
Comments:	
	•
Pop: 5	
1 1	

Resident Name:	George marier
Address:	189 M RIVER ROAD
Mailing Address:	Misseque (1780 Sme, 45 Asove
Treatment Type (if ap	oplicable): Sed - Proce Cartalon = 17ex
	SGC-9804- TU 293
	4/8/98 1345
Sample Collected From	m: K'Tch TAP
Comments:	
	· 65
P07:3	

RESIDENTIAL SAMPLE LOG

Resident Name:	Alice + Bruce Templeron
Address:	1897 Rine RD. N'SSE 410918 11780
	SAL AS ABOYCE
	plicable): No No
Location of Treatment	System: N/A
	SGC-9804- TW294 4/8/98 - 1420
	n: BAIN TAIP
Comments:	
	· ·
P69:5	

000**2**61

RESIDENTIAL SAMPLE LOG

Resident Name:	June + Doug Taylor
Address:	1953 River ROAD
	N. SSEG-09UE 11780
Mailing Address:	Same As Along
·	
Treatment Type (if a	pplicable): Series (carearge)
Location of Treatmen	t System: BAScreen
Sample No.	SGC-9804- TW 295
Sample Date/Time:	4/8/98 1535
Sample Collected Fro	m: UPSTORS BATTOOM TVB
Comments:	- ALCONS ONE, DES CONO DE TOC
Democh.	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	•
P6P : S	(3 chip (ed)
- \	

RESIDENTIAL SAMPLE LOG

Resident Name:	MATIA A NGEIA+3CAN ABCAMS
Address:	1975 River ROAD N. 550 que 90 e 11780
Mailing Address:	Same As ABOUR
Location of Treatment	plicable): 2 CATTETOJE Selve FITERS System: DAZENT (10ner 1 end
Sample No.	SGC-9804- TU 296
Sample Date/Time:	4/8/98 1600
Sample Collected From	n: Possages miggle lend Bothson TAP.
Comments:	
ROP:5	(3ch., 7ren)

Resident Name:	ART 62:33:N
Address:	197 River ROAD
Mailing Address:	N's Sequeque 11780 SAME AS ABOVE
Treatment Type (if ap	oplicable): Cicomet Basener
Location of Treatmen	t System: BASCOCT
Sample No.	SGC-9804- FW 297
Sample Date/Time:	4/4/98 1620
Sample Collected From	m: Fitch TAP
Comments:	
	4
Pop: >	

RESIDENTIAL SAMPLE LOG

Resident Name:	John CANTINO
Address:	207 River RD.
Mailing Address:	Same as 152000
Treatment Type (if and Location of Treatment	pplicable): からっと it System: ハ/ル
Sample No.	SGC-9804- T W 298
Sample Date/Time:	4/8/98 1645
Sample Collected Fro	m: Landy Room Facet (BASent)
Comments:	
Dop: 4	(2canon)

Database Entry:

000265

Resident Name:	Del: A		VC.TZE		
Address:	201 A	2iver ~ S	ROAD 11780		· · · · · · · · · · · · · · · · · · ·
Mailing Address:	Same u.				
Treatment Type (if application of Treatment	olicable): $\underline{\wedge}$	one /A			
Sample No. Sample Date/Time:	SGC-9804- TW	299			
Sample Collected Fron	1: UPSTA	rs n.a	House .	4A?	
Comments:					
	·				
		· · · · · · · · · · · · · · · · · · ·	4		
POP: 4	(2041)	sew).			

Resident Name:	Jan	es R.	Frankl	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
Address:			1 40005	ROAD 0-9609-	<u>.</u>
Mailing Address:			e As Al		
Treatment Type (if ap				· · · · · · · · · · · · · · · · · · ·	
Location of Treatment	System:	BASC	~=		
Sample No.	SGC-9804-	[W 300			
Sample Date/Time:	4/8/98	173	5		
Sample Collected From	n: <u>Ki</u> 7	dn Ta	P	•	
Comments:	WATER	Soco	res By D	assed and	Y
SARRIN					
		_			
			4		 _
P07:4 (10410)			
	,	000267		Database Entry:	

Resident Name:	L'NDA+DENN'S VITA
Address:	191 L River ROAD Nissegnogue 11780
Mailing Address:	SAME AS DES ONE
Treatment Type (if a	pplicable):
Location of Treatmen	nt System: WEII PIT
	SGC-9804- TW 301 BOOKS ON STOKE STOKE
Sample Date/Time:	4/9/98 1230
Sample Collected Fro	om: Fireles TAD
Comments:	
Pap: 3	(114)

RESIDENTIAL SAMPLE LOG

Resident Name:	PATTI YEAGER
Address:	212 010 min RD. Nissequoque 11780
Mailing Address:	SAR ABOJE
	plicable): <u>Novi</u> 은 System: <u>N/A</u>
Sample No.	SGC-9804- TW 302
Sample Date/Time:	4/9/98 1255
Sample Collected From	n: Kirchent TAP
Comments:	
	MSMSD
	ato
Pop: 1	

000269

Resident Name:	micheal Grosskoff
Address:	1 HIGHWOODS COUST
	ST JAmes 11780
Mailing Address:	Same Az Assove
Treatment Type (if a	pplicable): No へ C
Location of Treatmen	it System: NA
Sample No.	SGC-9804-TW303
	4/9/98 1400
Sample Collected Fro	m: Dawstales Barriogn TAP
Comments:	
	· 80
Pep: 5	(3CKIDSEN)
·	000270 Database Entry:

Resident Name:	Peter Curto
Address:	11 Hi. 64 WOODS COURT
Mailing Address:	ST JAMES 11780 SATE AS ADO-P
Treatment Type (if ap	oplicable): NONE System: N/A
	SGC-9804-Tw 304
Sample Date/Time:	4/9/94 1415
Sample Collected From	m: UPS-WS BATHOOM TAP
Comments:	
	· · ·
POP-2	
v .	

RESIDENTIAL SAMPLE LOG

Resident Name:	Dan	CLIA U	HAND)
Address:	28 S7 5	mig n wo	008 500	~ T
Mailing Address:		AS ABOU		
Treatment Type (if a Location of Treatmer	pplicable):	M'crome Dasens	T	
Sample No.	SGC-9804- T	130 <u>5</u> Detk at	t TW 30	(ULPLICATE)
Sample Date/Time:	4/9/98	1435		(DIPL'CATE)
Sample Collected Fro				
Comments:				
		<u> </u>		
		<		
				हि
POP. 2				

000272

Resident Name:	TERRY EILINGER
Address:	29 HIGHWOODS CONT
	57 James 11780
Mailing Address:	SAME AS MOOJE
Treatment Type (if an	oplicable): 2 2 CU 1500 T CARSON (51. LOEN
Location of Treatmen	t System: Breeze
Sample No.	SGC-9804- TW307 CM TW 308
Sample Date/Time:	4/9/98 1500 and 1510
Sample Collected From	m: Kitchen TAP
Comments:	TW307 WAS Collected with CATSON
FITER 3.P	assed and Tw308 was collected
	para an inc.
	·
Pop: 5	(3 chil Dru)



Resident Name:	Lois Youdelman
Address:	261R 01D Min Path Nº 5804-0900 11780
Mailing Address:	Same AS ABOUR
Treatment Type (if ap	oplicable): RO - Kirshul Sink ONLY
Location of Treatment	System: Work when we have the state of the s
Sample No.	SGC-9804- TW309
Sample Date/Time:	4/98 1330
Sample Collected From	m: Dowstars DASWOON TAD
Comments:	
	· A
Pop: 2	

×

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	JANEILE	KIDAIC
Address:	341 River	RS.
	ST JAMES	11780
Mailing Address:	SAME AS ABOU	<u>e</u>
Treatment Type (if ap	oplicable): CATTERTY	exerson ziver
Location of Treatment	System: BASCOT (P	omo Moora
Sample No.	SGC-9804- TW 310 AN	0 311
Sample Date/Time:	4/15/98 1630 + 164	5
Sample Collected From	m: Kitchen Trap (Tw: Trap (Tw:	BIG) AND PRESSURE TANK
Comments:		
TW 310 15	Pest reamit	
TW 311 15	Pie reami	
	· · · · · · · · · · · · · · · · · · ·	
Jobs (3	chipren)	
	,	

000275

/₩

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	L'NDA D'ELGGENZO
Address:	193 River RD.
Address:	•
	N. 556 9-09-08 11780
Mailing Address:	Do Box 132
	57 James 11780
Treatment Type (if ap	oplicable): Softwer + sesime FITEN
Location of Treatmen	t System: love level
Sample No.	SGC-9804- TW 312
Sample Date/Time:	4/15/98 1720
Sample Collected Fro	m: Kitchen Tap
Comments:	Solvace By passed During Sampling.
	, , , , , , , , , , , , , , , , , , ,
	B
20.3	
	

RESIDENTIAL SAMPLE LOG

Resident Name:	Ken McSuceney
	(
Address:	193A Rica RD.
	193A Rice RD. N'SSEG-SPER 11780
	• /
Mailing Address:	Spre AS ADOVE
Treatment Type (if ap	oplicable): AQUATWN - Softmer
Location of Treatment	t System: "SASCULUT
Sample No.	SGC-9804- TW 313
Sample Date/Time:	4/16/98 \$:45
	m: Kitalen TAP
Comments:	SOFTME BYPASSED FOR SAMPLINY.
	(2)
DOB: 7	
+ • • • • • • • • • • • • • • • • • • •	

000277

Resident Name:	TSU	Loo		
Address:	41 F	DRM ROP	N.D.	
Mailing Address:		uoque us Arsev		
Treatment Type (if ap	plicable): <u>S</u>	of thee /c	constitute	
Location of Treatment				
Sample No.	SGC-9804- TU	1314		
Sample Date/Time:	4/16/98 1	210		
Sample Collected From	n: <u>OUTS.</u>	oe sacot		
Comments:				
Wenne	pm 150			
		4		- BA
Pap: 3				
,				/ -

RESIDENTIAL SAMPLE LOG

Resident Name:	William REA
Address:	15 FARM ROAD
	Nissequaque 11780
Mailing Address:	SAME NS ASSI-1
Treatment Type (if ap	oplicable): Sofones + CABON UN'T GEOF)
Location of Treatmen	t System: BASeuri
Sample No.	SGC-9804- TW315
Sample Date/Time:	4/16/98 1250
Sample Collected From	m: 6075:00 50:60T
Comments:	Our slog Spicer Before Trameur.
Wen DepTh	-235
P.O. 3	

000279

Resident Name:	Auti	ichio,	Rathryn		
Address:	92627 St.	6 five James	1 Road 117-80	····	· .
Mailing Address:		same	•		
Treatment Type (if a	pplicable):		ne		
Location of Treatmen	t System:	N	14		
Sample No.	SGC-9804-	TN 31	6		
Sample Date/Time:					
Sample Collected Fro		Kitchen	n sink		
Comments:		water	in expected	to be	teceinst
in place u			-		
					•
					Access of the Control
			ý		
Population:	4				

Resident Name:	De Betta, Jeanette
Address:	287 River Rd. St. James
Mailing Address:	-Same -
Treatment Type (if apple Location of Treatment	\mathcal{A}
	SGC-9804- TW317
<u>-</u>	4/16/98 /1700
Sample Collected From	outside spigot
Comments:	
Pop: 3	
	Database Entry:

Resident Name:	P. NOEL	Moh	AMMED	
Address:	HICAD OF	THE MARSOT	ス D . 780	· · · · · · · · · · · · · · · · · · ·
Mailing Address:				
Treatment Type (if a Location of Treatmer Sample No.	nt System:)/A	·	
Sample Date/Time:				
Sample Collected Fro	om: titche	N Sink		
Comments:				-
		*		(A)
Pop: 4	(عدلتان	Men)		

Resident Name:	DANTONIO, Kathleen
Address:	277 River Road
	-st. James 11780
Mailing Address:	- Same-
Treatment Type (if a	pplicable): Particulate Dirt/leust Aqua Pure Basement.
Location of Treatmer	t System: Basement.
Sample No.	SGC-9804-Tw319
Sample Date/Time:	4/17/98/0945
Sample Collected Fro	
Comments:	Removed the filter before the sample
Was colle	
<u> </u>	
N	62
Pop: EG	
	000283 Database Entry:

Resident Name:	Johnson, Robert
Address:	194B River Rd.
	St. James, 11780
Mailing Address:	- Same -
Treatment Type (if a	J
Location of Treatmen	nt System: Balement
Sample No.	SGC-9804- TW 32-0
Sample Date/Time:	4/17/98/1035 hrs
Sample Collected Fro	om: <u>Kitchen sink</u> .
Comments:	By-Passed the system before the was Collected.
<u>Sample</u>	was Collected.
	8
Pop: 2	
· V	

Resident Name:	GNOLFO, bernard
Address:	5t. James, 11780
Mailing Address:	-Same -
Treatment Type (if a	Account
Location of Treatmen	System:
_	SGC-9804-TW32/
Sample Date/Time:	4/17/98/1100 hrs
Sample Collected Fro	Kit Bathroom tap
Comments:	could not by-pas me particulate filler
(Dirtfrust)	•
-	
····	@)
Pop:6	
	000285 Database Entry:



Database Entry:

Resident Name:	ENRICA + RICLARD HUNTLEY
Address:	NISSEQUOQUE 11780
Mailing Address:	SAME ABOVE
	pplicable): POWTOFUSE PUR FITOR
Sample No.	SGC-9804- TW 31000 + TW 346 DUPICATE)
Sample Date/Time:	4/15/98 1955 (BETL)
Sample Collected Fro	om: Kirolan TAP
Comments:	FITTER RENOVAL FOR SAMPING
Pop: 2	

RESIDENTIAL SAMPLE LOG

Resident Name:	DAWN Sorci
Address:	25413 STONEGATE Nissequoque 11780
Mailing Address:	SAME AS ABOUR
Treatment Type (if ap	plicable): No N C
Location of Treatment	System: N/A 324 (58)
	SGC-9804- TW 312
Sample Date/Time:	4/15/98 2015
Sample Collected From	n: Kirclew TAP
Comments:	
	*
4,06:1	(A)

Database Entry: ___

RESIDENTIAL SAMPLE LOG

Resident Name:	Richard Curth
Address:	28 HARBOT HILL ROAD
	MEAS) OF THE MATBOT 11780
Mailing Address:	Same as above +
	STJAMES 11780
m	
Treatment Type (if ap	plicable): <u>CARBON FITTER ON WATER IN</u> COTTAGE - NOT
Location of Treatment	System:
Sample No.	SGC-9804- TW 325
Sample Date/Time:	4/17/98 1235
Sample Collected Fron	n: kitcher Sine TAP - Main House
Comments:	NO TREAT MET ON MAIN HOUSE
POP: 4	e e
1010	

000288

M2/M2D

SMITHTOWN GROUNDWATER CONTAMINATION

RESIDENTIAL SAMPLE LOG

Resident Name:	Reeth
Address:	19 Frog Hollow Rd. St. James NY 11708 Same
Mailing Address:	Same
Treatment Type (if a	· · · · · · · · · · · · · · · · · · ·
Location of Treatmer	t System:
Sample No.	SGC-9804-TU-325 TW 326
Sample Date/Time:	4/17/98 1510
Sample Collected Fro	4/17/98 1510 m: Kitchen Fauct
Comments:	
Pol, 2	
11/1	

#332 Wednot Whe d. during De Samping and Survival and Sur

(DF)

Database Entry:

SMITHTOWN GROUNDWATER CONTAMINATION

Resident Name:	Brian Gordon
Address:	246 A Stone Gate
Mailing Address:	St. James, NY 11780
1714ming 11441000.	
Treatment Type (if a	y v
Location of Treatmer	nt System: Basement Kup
Sample No.	SGC-9804- TW327 TW328
Sample Date/Time:	4/17/98 1600 1610
Sample Collected Fro	om: Kitchen Faucet
Comments:	Treatment system bypassed to get samp
	- 180 feet
Pop:	· · · · · · · · · · · · · · · · · · ·
	000291 Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name: Ox. Steven Bernadini
Address: 37 Forces Hollowkd. St. James NY 11780
Mailing Address: P. O. Box 2217 St. James, NY 11786
Treatment Type (if applicable): Location of Treatment System: Basement.
Sample No. SGC-9804- TW 329 Sample Date/Time: 4/17/98 1730
Sample Collected From: <u>fitchen</u> Comments: <u>Post treatment sample</u> . <u>Pose-treatment Collected last week</u>
The house where preced was replaced.
Pop: \

000292

RESIDENTIAL SAMPLE LOG

Resident Name:	Fell
Address:	12 Movidues Rd.
Mailing Address:	St. James, NY 11786
Treatment Type (if ap	$\rho \rightarrow t$
Sample No.	SGC-9804-TW330
Sample Date/Time:	4/17/99 1645
Sample Collected Fro	m. Basement before the fatter
Comments:	<i>V</i>
Sample	collected before treatment at the
outlet	next to the water tank.
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Pp:- J	
•	000293 Database Entry:

RESIDENTIAL SAMPLE LOG

Resident Name:	Alexander fa	ndall
Address:		
	54 Harbor Hill St. James NY	11786
Mailing Address:	P.O. Box 219	
	St. James, W	7.11780
Treatment Type (if a	pplicable): Mme	
Location of Treatmen	//))	
Sample No.	SGC-9804-Tu \$331	1
Sample Date/Time:	4/12/98	1740
Sample Collected Fro	m: <u>Kitchen</u>	
Comments:		
		-
***************************************	<u></u>	
Pop: 4	(2 children)	

RESIDENTIAL SAMPLE LOG

Resident Name:	Stophen Schmidt
Address:	4 Tide mill lane
	Nissequaque (STJAMES) 11780
Mailing Address:	Som as Asove
Treatment Type (if a	pplicable): No Ne
Location of Treatmen	it System: N/A
Sample No.	SGC-9804- T= 373 TW 333
Sample Date/Time:	4/17/98 1615
Sample Collected Fro	m: Donnstales BATWOON TAP
Comments:	
	•
Pop:6 (4	(W, D; cu)
	000295 Database Entry:

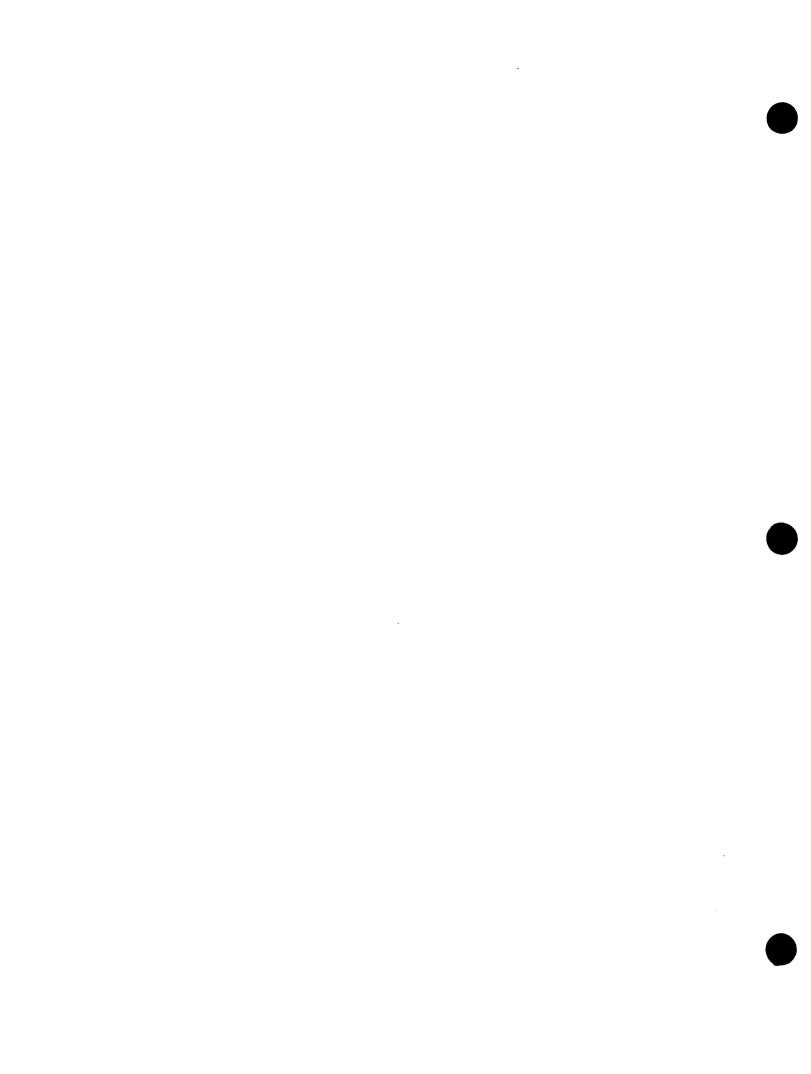
RESIDENTIAL SAMPLE LOG

Resident Name:	CATOI PICCLION
Address:	263 OID M'11 ROAD
	Nissoque 11780
Mailing Address:	SALE AS ARSOLP
	plicable): _ N ov (
Location of Treatment	System: N/A
	SGC-9804- TN 334 + TW 335 (DUPC)
Sample Date/Time:	4/17/98 1645
Sample Collected Fron	n: Rizelen TAP
Comments:	
Pop: 3	3
-	

111296

Database Entry:

REFERENCE NO. 11





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1090 King Georges Post Road
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SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM EPA CONTRACT 68-W5-0019

DATA QUALITY OBJECTIVE

DOCUMENT CONTROL NO.: START-02-F-01788 SMITH TOWN, LONG ISLAND PROJECT NO.: 2500 SDG NO.: E0468

> REPORTED BY ROY F. WESTON, INC.

REVIEVED BY:

Zohreh Hamid, Ph.D.

Senior Chemist

5-10-28

Date

000001



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SMITH TOWN, LONG ISLAND SITE PROJECT NUMBER: 2500 SDG NUMBER: E0468

DISCUSSION

Fourteen water samples, including one trip blank was collected on 04-03-98. Mitkem Corporation Laboratory located in Warwick, Rhode Island received the samples in good condition on 04-06-98. The samples were analyzed according to EPA Method 524.2 for specific volatile target compounds.

Based on the chain-of-custody records, the following samples with laboratory IDs E0468-01 to E0468-14 were encountered in this data package:

TB01	TW151	TW153
TW01	TW152	TW154
TW02	TW04	TW07
TW03	TW05	TW08
TW150	TW06	

The analysis data have been evaluated according to the USEPA Region II Functional Guidelines and the Quality Control criteria set forth in the applied Method based on the following parameters:

- Holding Time
- Calibration Analysis
- Blank Analysis
- Matrix Spike/Spike Duplicate (MS/MSD)
- Laboratory Control Sample Results
- Field Duplicate
- Instrument Performance
- Surrogate Recovery
- Internal Standard Recovery
- Compound Identification/Quantitation
- Data package completeness

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Smith Town, Long Island Laboratory ID Number: E0468

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Holding Time

Samples were prepared and analyzed according to the criteria set forth in the USEPA Method 524.2 for specific volatile target compounds. All samples were collected on 04-03-98 and analyzed on 04-06,07-98, within the 7-day analysis holding time. The cooler temperature (4°C) was within the control limits

Calibration

A five point initial calibration and continuing calibration analysis were included in this data package. The %RSDs, %Ds, and response factors were within the control limits

Blank Analysis

The laboratory blank VBLK5T and trip blank had methylene chloride (0.4 ug/l) and chloroform (13 ug/l) respectively. The reported sample results were considered as non-detected values and were qualified "U". Storage blank has had one non-target compound at retention time 14.2. The corresponding sample results were rejected.

Matrix Spike/Spike Duplicate Analysis

The QC samples were not analyzed with this batch.

Laboratory Control Sample

Three laboratory control spike samples were analyzed with this batch. The recoveries were within the control limits of 80-170%.

Instrument Performance

The samples were analyzed within the 12 hours from the tune. The ion abundance ratios for the BFB check standard were within the control limits.

Surrogate Recovery

Samples were spiked with two surrogate compounds (bromofluorobenzene and 1,2-dichlorobenzene-d₄). The recoveries were within the control limits of 80-120% established by the laboratory.



Smith Town, Long Island Laboratory ID Number: E0468

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Internal Standard Analysis

The samples were spike with two internal standards prior to the sample analysis. The comparison of the sample area with the corresponding daily calibration analysis demonstrated that the recoveries and the retention times of the internal standards were within the requirement limits.

Duplicate Analysis

Field duplicate samples were not analyzed with this batch.

Compound Quantitation/Identification

All samples were analyzed at one-fold dilutions.

The results for 1,1,1-trichloroethane in samples TW03, TW152 & TW153, and 1,2,3-trichloropropane in sample TW150 were qualified "J", since their mass spectra did not match the reference standard spectra.

The non-target compounds (unknowns) were reported in some samples. The result for the unknown detected at retention time 14.2 minutes was rejected in samples, due to the laboratory blank contamination.

The results below the CRQL were qualified estimated, due to the uncertainty near the detection limits.

Data Package Completeness

The data package completeness and the quality of the sample results were considered satisfactory. The major problems were not encountered during the sample analysis. The minor issues have been discussed. The reported sample data are accepted with the applied qualifier codes.



- 1. Appendix A- Glossary of Data Qualifier
- 2. Appendix B- Data Summary Forms
- 3. Appendix C- Laboratory Results
- 4. Appendix D- Region II Work Sheet
- 5. Appendix E Support Documentation



Appendix A Glossary of Data Qualifier



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GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

- U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

 [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2- butanone in the VOA analyses, and common phthalates in the BNA analyses, along with tentatively identified compounds) or less than 5 times the blank level for other target compounds.]
- R = UNUSABLE RESULT. THE PRESENCE OR ABSENCE OF THIS ANALYTE CANNOT BE VERIFIED. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.
- N = NEGATED COMPOUND. THERE IS PRESUMPTIVE EVIDENCE TO MAKE A TENTATIVE IDENTIFICCATION.

CODES RELATING TO QUATITATION

(can be used for both positive results and sample quantitation limits):

- J = ANALYTE WAS POSITIVELY IDENTIFIED. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.
- UJ = ANALYTE WAS NOT DETECTED. THE REPORTED QUATITATION LIMIT IS QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

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Appendix B Data Summary Forms

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0468

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TB01 E0468-01 WATER 1.0 ug/L	TW01 E0468-02 WATER 1.0 ug/L	TW02 E0468-03 WATER 1.0 ug/L	TW03 E0468-04 WATER 1.0 ug/L	TW04 E0468-08 WATER 1.0 ug/L	TW05 EO468-09 WATER 1.0 ug/L	TW06 E0468-10 WATER 1.0 ug/L
TARGET COMPOUNDS:								
	Reporting							
	Limit							
Dichlorodifluoromethane	0.5							
Chloromethane	0.5							
Vinyl Chloride	0.5							
Bromomethane	0.5							
Chloroethane	0.5							
Trichlorofluoromethane	0.5							
1,1-Dichloroethene	0.5					0.78		
Methylene Chloride	0.5							
trans-1,2-Dichloroethene	0.5							
Methyl tert-butyl ether	0.5		4.7					
1,1-Dichloroethane	0.5					3.6		
cis-1,2-Dichloroethane	0.5							
2,2-Dichloropropane	0.5							
1,2-Dichloroethane	0.5							
Bromochloromethane	0.5							
Chloroform	0.5	13	0.5 U					
Carbon Tetrachloride	0.5							
1,1,1-Trichloroethane	0.5			1	0.51 J	4		
1,1-Dichloropropene	0.5							
Trichloroethene	0.5					1.9		
1,2-Dichloropropane	0.5							•
Benzene	0.5							
Dibromomethane	0.5						•	
Bromodichloromethane	0.5							
cis-1,3-Dichloropropene	0.5							
Toluene	0.5							
Trans-1,3-Dichloropropene	0.5							
1,1,2-Trichloroethane	0.5							
Tetrachloroethene	0.5							
1,3-Dichloropropane	0.5							
Dibromochloromethane	0.5							
1,2-Dibromoethane	0.5							
Chlorobenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Ethylbenzene	0.5							
m,p-Xylene	0.5							

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0468

CLIENT SAMPLE ID:	TB01	TW01	TW02	TW03	TW04	TW05	TW06	
LAB SAMPLE ID:	E0468-01	E0468-02	E0468-03	E0468-04	E0468-08	EO468-09	E0468-10	
MATRIX:	WATER							
DILUTION FACTOR:	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
UNITS	ug/L							

	TARGET COMPOUNDS:	
		Reporting
		Limit
	o-Xylene	0.5
	Styrene	0.5
	Bromoform	0.5
	Isopropylbenzene	0.5
	1,1,2,2-Tetrachloroethane	0.5
	Bromobenzene	0.5
	1,2,3-Trichloropropane	0.5
\supset	n-Propylbenzene	0.5
5	2-Chlorotoluene	0.5
	1,3,5-Trimethylbenzene	0.5
\supseteq	4-Chlorotoluene	0.5
	tert-Butylbenzene	0.5
-4-	1,2,4-Trimethylbenzene	0.5
\supset	sec-Butlybenzene	0.5
	1,3-Dichlorobenzene	0.5
	4-Isopropyltoluene	0.5
	1.4-Dichlorobenzene	0.5
	P. O. L	0.5

n-Butlybenzene
1,2-Dichlorobenzene
1,2-Dibromo-3-chloropropane
1,2,4-Trichlorobenzene
Hexachlorobutadiene

1,2,3-Trichlorobenzene

Naphthalene

Remarks:	Trip Blank

0.5 0.5 0.5 0.5 0.5

0.5

0.5

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0468

	CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW07 E0468-13 WATER 1.0 ug/L	TW08 E0468-14 WATER 1.0 ug/L	TW150 E0468-05 WATER 1.0 ug/L	TW151 E0468-06 WATER 1.0 ug/L	TW152 E0468-07 WATER 1.0 ug/L	TW153 E0468-11 WATER 1.0 ug/L	TW154 E0468-12 WATER 1.0 ug/L
	TARGET COMPOUNDS:								
		Reporting							
		Limit							
	Dichlorodifluoromethane	0.5							
	Chloromethane	0.5							
	Vinyl Chloride	0.5							
>	Bromomethane	0.5							
S	Chloroethane Trichlorofluoromethane	0.5 0.5							
)	1.1-Dichloroethene	0.5 0.5							
5	Methylene Chloride	0.5							
_	trans-1,2-Dichloroethene	0.5							
	Methyl tert-butyl ether	0.5	0.66				0.68		0.5
_	1,1-Dichloroethane	0.5	0.00		1.7				
	cis-1,2-Dichloroethane	0.5						•	
	2,2-Dichloropropane	0.5							
	1,2-Dichloroethane	0.5							
	Bromochloromethane	0.5							
	Chloroform	0.5				0.62 U		•	0.5 U
	Carbon Tetrachloride	0.5							
	1,1,1-Trichloroethane	0.5			1.2	2.2	0.53 J	0.8 J	
	1,1-Dichloropropene	0.5							
	Trichloroethene	0.5			4.4				
	1,2-Dichloropropane	0.5			14				
	Benzene	0.5							
	Dibromomethane Bromodichloromethane	0.5 0.5							
	cis-1,3-Dichloropropene	0.5 0.5							
	Toluene	0.5					0.42 J		0.39 J
	Trans-1,3-Dichloropropene	0.5					0.12 0		5.55 5
	1,1,2-Trichloroethane	0.5							
	Tetrachloroethene	0.5	2.1			ř.			
	1,3-Dichloropropane	0.5	<u>-</u>	•					
	Dibromochloromethane	0.5							
	1,2-Dibromoethane	0.5							
	Chlorobenzene	0.5							
	1,1,2,2-Tetrachloroethane	0.5						•	
	Ethylbenzene	0.5		•					
	m,p-Xylene	0.5							

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500

LABORATORY ID NO./SDG: E0468

CLIENT SAMPLE ID: .AB SAMPLE ID: MATRIX: DILUTION FACTOR: JNITS	TW07 E0468-13 WATER 1.0 ug/L	TW08 E0468-14 WATER 1.0 ug/L	TW150 E0468-05 WATER 1.0 ug/L	TW151 E0468-06 WATER 1.0 ug/L	TW152 E0468-07 WATER 1.0 ug/L	TW153 E0468-11 WATER 1.0 ug/L	TW154 E0468-12 WATER 1.0 ug/L
TARRET COMPONINGS.							
rarget compounds:	Reporting						
	Limit						
-Xylene	0.5						
Styrene	0.5			•			
Bromoform	0.5						
sopropyibenzene	0.5		•				
1,1,2,2-Tetrachloroethane	0.5						
3romobenzene	0.5						
1,2,3-Trichloropropane	0.5		2 J				
n-Propylbenzene	0.5		_ •				
2-Chlorotoluene	0.5						
1,3,5-Trimethylbenzene	0.5						
⊱Chlorotoluene	0.5						
ert-Butylbenzene	0.5						
1,2,4-Trimethylbenzene	0.5						
sec-Butlybenzene	0.5						
1,3-Dichlorobenzene	0.5						
1-isopropyltoluene	0.5						
I,4-Dichlorobenzene	0.5						
n-Butlybenzene	0.5						
1,2-Dichlorobenzene	0.5						
1,2-Dibromo-3-chloropropane							
1.2.4-Trichlorobenzene	0.5						
-lexachlorobutadiene	0.5						
Vaphthalene	0.5						
1.2.3-Trichlorobenzene	0.5						

Remarks:



Appendix C Laboratory Reported Result

EPA SAMPLE NO.

TB01

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-01

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3298

Level:

(low/med)

Date Received: 04/06/98

% Moisture: not dec. __

LOW

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	U
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	-
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	13	O
56-23-5Carbon Tetrachloride	0.50	TT
71-55-61,1,1-Trichloroethane	0.50	
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	_
142-28-91,3-Dichloropropane	0.50	-
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	
TOO SO , CHILDEDDOILEGING	0.50	

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EPA SAMPLE NO.

TB01

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-01

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3298

(low/med)

Level:

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/07/98

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

GC Column: DB-624

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	-
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	_
98-82-8Isopropylbenzene	0.50	-
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	•
95-49-82-Chlorotoluene	0.50	•
108-67-81,3,5-Trimethylbenzene	- ' - '	_
106-43-44-Chlorotoluene	0.50	
	0.50	ł
98-06-6tert-Butylbenzene	0.50	_
95-63-61,2,4-Trimethylbenzene	0.50	_
135-98-8sec-Butylbenzene	0.50	
541-73-11,3-Dichlorobenzene	0.50	_
99-87-64-Isopropyltoluene	0.50	_
106-46-71,4-Dichlorobenzene	0.50	•
104-51-8n-Butylbenzene	0.50	
95-50-11,2-Dichlorobenzene	0.50	_
96-12-81,2-Dibromo-3-chloropropane	0.50	T
120-82-11,2,4-Trichlorobenzene	0.50	_
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.

TW01

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-02

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3285

Level: (low/med)

Date Received: 04/06/98

LOW

Date Analyzed: 04/06/98

% Moisture: not dec. ___

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

75-71-8	0.50 0.50
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EPA SAMPLE NO.

TW01

Lab Name: MITKEM CORP.

Contract:

SDG No.: E0468

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

Matrix: (soil/water) WATER

Lab File ID:

Sample wt/vol:

25.00 (g/mL) ML

V5A3285

Level:

(low/med)

Date Received: 04/06/98

Lab Sample ID: E0468-02

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	-
95-47-6O-Xylene	0.50	
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	_
	0.50	Ü
98-82-8Isopropylbenzene		_
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	
108-67-81,3,5-Trimethylbenzene	0.50	-
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	Ū
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	
96-12-81,2-Dibromo-3-chloropropane	0.50	_
120-82-11,2,4-Trichlorobenzene	0.50	Ū
87-68-3Hexachlorobutadiene	0.50	1 -
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	Ŭ
		·

EPA SAMPLE NO.

TW02

Lab Name: MITKEM CORP.

Lab Code: MITKEM Case No.:

Contract:

SAS No.: SDG No.: E0468

Matrix: (soil/water) WATER Lab Sample ID: E0468-03

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3286

Level: (low/med) LOW Date Received: 04/06/98

% Moisture: not dec. _____ Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

	· -		I
75-71-8Dichlorodifluoromethane	0.50	ָּט	
74-87-3Chloromethane	0.50		i
75-01-4Vinyl Chloride	0.50		ĺ
74-83-9Bromomethane	0.50		l
75-00-3Chloroethane	0.50		l
75-69-4Trichlorofluoromethane	0.50		
75-35-41,1-Dichloroethene	0.50		ĺ
75-09-2Methylene Chloride	0.50		i
156-60-5trans-1,2-Dichloroethene	0.50		l
1634-04-4Methyl tert-butyl ether	0.50		i
75-34-31,1-Dichloroethane	0.50		İ
156-59-2cis-1,2-Dichloroethene	0.50		i
590-20-72,2-Dichloropropane	0.50		i
107-06-21,2-Dichloroethane	0.50		l
74-97-5Bromochloromethane	0.50		
67-66-3Chloroform	0.50		ĺ
56-23-5Carbon Tetrachloride	0.50		l
71-55-61,1,1-Trichloroethane	1.0		ĺ
563-58-61,1-Dichloropropene	0.50	Û	ı '
79-01-6Trichloroethene	0.50	Ū	ĺ
78-87-51,2-Dichloropropane	0.50	U	İ
71-43-2Benzene	0.50	U	l
74-95-3Dibromomethane	0.50		i
75-27-4Bromodichloromethane	0.50	υ .	
10061-01-5cis-1,3-Dichloropropene	0.50	U	ĺ
108-88-3Toluene	0.50	ט	ĺ
10061-02-6trans-1,3-Dichloropropene	0.50	U	ĺ
79-00-51,1,2-Trichloroethane	0.50	U	ĺ
127-18-4Tetrachloroethene	0.50	ָּד	i
142-28-91,3-Dichloropropane	0.50	U	l
124-48-1Dibromochloromethane	0.50	Ū	l
106-93-41,2-Dibromoethane	0.50	U	l
108-90-7Chlorobenzene	0.50	U	

137-

FORM I VOA OLMO3.0

EPA SAMPLE NO.

TW02

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3286

Level: (low/med) LOW

Date Received: 04/06/98

Lab Sample ID: E0468-03

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

630-20-6	1,1,1,2-Tetrachloroethane	0.50	ש
	Ethylbenzene	0.50	
	m,p-Xylene	0.50	
95-47-6		0.50	
100-42-5		0.50	
75-25-2		0.50	-
	Isopropylbenzene	0.50	١ -
	1,1,2,2-Tetrachloroethane	0.50	1 -
	Bromobenzene		1 -
		0.50	•
96-18-4	1,2,3-Trichloropropane	0.50	1
	n-Propylbenzene	0.50	1 ~
	2-Chlorotoluene	0.50	, -
	1,3,5-Trimethylbenzene	0.50	1
	4-Chlorotoluene	0.50	I .
	tert-Butylbenzene	0.50	_
	1,2,4-Trimethylbenzene	0.50	U
135-98-8	sec-Butylbenzene	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
99-87-6	4-Isopropyltoluene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
	n-Butylbenzene	0.50	U
	1,2-Dichlorobenzene	0.50	υ
	1,2-Dibromo-3-chloropropane	0.50	
120-82-1	1,2,4-Trichlorobenzene	0.50	U
87-68-3	Hexachlorobutadiene	0.50	ט
	Naphthalene	0.50	1
	1,2,3-Trichlorobenzene	0.50	ı
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EPA SAMPLE NO.

TW03	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-04

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3287

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec. _____

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

	(ug/1 of a	J. J. ,	~
75-71-8	Dichlorodifluoromethane	0.50	T)
	Chloromethane	0.50	
75-01-4	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	- 0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
75-09-2	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	
75-34-3	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	
590-20-7	2,2-Dichloropropane	- 0.50	
107-06-2	1,2-Dichloroethane	0.50	1
	Bromochloromethane	- 0.50	
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.51	
	1,1-Dichloropropene	0.50	
	Trichloroethene	0.50	
	1,2-Dichloropropane	0.50	
71-43-2		0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.50	
	1,3-Dichloropropane	0.50	II
	Dibromochloromethane	0.50	
	1,2-Dibromoethane	0.50	
	Chlorobenzene	0.50	
		-	

EPA SAMPLE NO.

TW03

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-04

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3287

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec. _____

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CAS NO. COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

(20 20 C 1 1 1 2 Westwaghlereethane	0.50	77
630-20-61,1,1,2-Tetrachloroethane		_
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	_
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	Ū
96-18-41,2,3-Trichloropropane	0.50	Ū
103-65-1n-Propylbenzene	0.50	Ū
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	Ū
98-06-6tert-Butylbenzene	0.50	Ū
95-63-61,2,4-Trimethylbenzene	0.50	ַ <u>י</u>
135-98-8sec-Butylbenzene	0.50	ט
541-73-11,3-Dichlorobenzene	0.50	Ū
99-87-64-Isopropyltoluene	0.50	Ū
106-46-71,4-Dichlorobenzene	0.50	IJ
104-51-8n-Butylbenzene	0.50	_
95-50-11,2-Dichlorobenzene	0.50	_
96-12-81,2-Dibromo-3-chloropropane_	0.50	_
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	_
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	f
1,2,3 III CHIO ODCHIZCHO	.0.50	Ŭ
		l

FORM I VOA

EPA SAMPLE NO.

TW04

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-08

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3291

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

75-71-8Dichlorodifluoromethane	0.50	
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	ן טן
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	U
75-35-41,1-Dichloroethene	0.78	
75-09-2Methylene Chloride	0.50	Ū
156-60-5trans-1,2-Dichloroethene	0.50	ט
1634-04-4Methyl tert-butyl ether	0.50	ן ט
75-34-31,1-Dichloroethane	3.6	
156-59-2cis-1,2-Dichloroethene	0.50	Ū
590-20-72,2-Dichloropropane	0.50	ן ט
107-06-21, 2-Dichloroethane	0.50	ן טן
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	4.0	
563-58-61,1-Dichloropropene	0.50	Û
79-01-6Trichloroethene	1.9	
78-87-51,2-Dichloropropane	0.50	Ū
71-43-2Benzene	0.50	ן ט
74-95-3Dibromomethane	0.50	ט
75-27-4Bromodichloromethane	0.50	ט
10061-01-5cis-1,3-Dichloropropene	0.50	ט
108-88-3Toluene	0.50	U
10061-02-6trans-1,3-Dichloropropene	0.50	ן ט
79-00-51,1,2-Trichloroethane	0.50	ן די
127-18-4Tetrachloroethene	0.50	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	
Too yo , cittotobelibelie	2.20	

EPA SAMPLE NO.

TW04

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-08

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3291

LOW

Level: (low/med)

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

	·-···	
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6Styrene 100-42-5Styrene 75-25-2Bromoform 98-82-8Isopropylbenzene 79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene 96-18-41,2,3-Trichloropropane 103-65-1	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	ַ המחמממממממממממממממממממממממממממממממממממ
99-87-64-Isopropyltoluene 106-46-71,4-Dichlorobenzene 104-51-8n-Butylbenzene	0.50 0.50 0.50	U U U U U U U U

FORM I VOA

EPA SAMPLE NO.

TW05

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-09

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3292

Level: (low/med) LOW Date Received: 04/06/98

% Moisture: not dec.

CAS NO.

Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

	· · · · · · · · · · · · · · · · · · ·	
75-71-8Dichlorodifluoromethane	0.50 0	
74-87-3Chloromethane	0.50 U	
75-01-4Vinyl Chloride	0.50 U	
74-83-9Bromomethane	0.50 U	
75-00-3Chloroethane	0.50 U	
75-69-4Trichlorofluoromethane	0.50 U	
75-35-41,1-Dichloroethene	0.50 U	
75-09-2Methylene Chloride	0.50 U	
156-60-5trans-1,2-Dichloroethene	0.50 U	
1634-04-4Methyl tert-butyl ether	0.50 U	
75-34-31,1-Dichloroethane	0.50 U	
156-59-2cis-1,2-Dichloroethene	0.50 0	
590-20-72,2-Dichloropropane	0.50 U	
107 06 2 1 2 Dishlementhers		
107-06-21,2-Dichloroethane	0.50 U	
74-97-5Bromochloromethane	0.50 U	
67-66-3Chloroform	0.50 U	
56-23-5Carbon Tetrachloride	0.50 U	
71-55-61,1,1-Trichloroethane	0.50 U	
563-58-61,1-Dichloropropene	0.50 U	
79-01-6Trichloroethene	0.50 U	
78-87-51,2-Dichloropropane	0.50 U	
71-43-2Benzene	0.50 U	
74-95-3Dibromomethane	0.50 U	
75-27-4Bromodichloromethane	0.50 U	
10061-01-5cis-1,3-Dichloropropene	0.50 U	
108-88-3Toluene	0.50 U	
10061-02-6trans-1,3-Dichloropropene	0.50 U	
79-00-51,1,2-Trichloroethane	0.50 U	
127-18-4Tetrachloroethene	0.50 U	•
142-28-91,3-Dichloropropane	0.50 U	
124-48-1Dibromochloromethane	0.50 U	
106-93-41,2-Dibromoethane	0.50 U	
108-90-7Chlorobenzene	0.50 U	
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EPA SAMPLE NO.

TW05

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-09

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3292

Level:

Soil Extract Volume: (uL)

(low/med) LOW

Date Received: 04/06/98

Date Analyzed: 04/06/98

% Moisture: not dec.

Dilution Factor: 1.0

GC Column: DB-624 ID: 0.25 (mm)

CAS NO.

COMPOUND

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

	, J.	J	~
100-41-4 136777-61-2 95-47-6 100-42-5 75-25-2	o-Xylene Styrene	0.50 0.50 0.50 0.50 0.50 0.50	ם ח ח ח
108-86-1	1,1,2,2-Tetrachloroethane Bromobenzene 1,2,3-Trichloropropane n-Propylbenzene	0.50 0.50 0.50 0.50	U U
95-49-8 108-67-8 106-43-4	2-Chlorotoluene1,3,5-Trimethylbenzene4-Chlorotoluenetert-Butylbenzene	0.50 0.50 0.50 0.50	U U U
95-63-6 135-98-8 541-73-1	1,2,4-Trimethylbenzene sec-Butylbenzene 1,3-Dichlorobenzene 4-Isopropyltoluene	0.50 0.50 0.50 0.50	บ บ บ
106-46-7 104-51-8 95-50-1	1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane	0.50 0.50 0.50 0.50	U U U
120-82-1 87-68-3 91-20-3	1,2,4-Trichlorobenzene	0.50 0.50 0.50 0.50	บ บ บ

FORM I VOA

EPA SAMPLE NO.

TW 06	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

1 Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-10

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V5A3293

Level: (low/med)

d) LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume:____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8	74-87-3	CAD NO.	COMPOSID (dg/H Of dg	3/1tg/ 00/11	V
74-87-3	74-87-3	75-71-8	Dichlorodifluoromethane	0.50	U
75-01-4	75-01-4				
74-83-9	74-83-9	75-01-4	Vinvl Chloride		
75-00-3	75-00-3	74-83-9	Bromomethane		
75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5	75-69-4				
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 66-23Chloroform 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 71-55-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 79-01-6Trichloroethene 0.50 U 79-01-6Trichloroethane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U <td>75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5</td> <td></td> <td></td> <td></td> <td></td>	75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5				
75-09-2	75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 79-01-6Trichloropropene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-01-5				
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloroethane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Chloroform 0.50 U 66-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloropethene 0.50 U 590-20-72,2-Dichloroethane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 78-87-51,2-Dichloropropene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 122-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U				
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Chloroform 0.50 U 56-3-58-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 108-88-3Toluene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 17-18-4Tetrachloroethane 0.50 U 127-18-4Tetrachloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Bromochloromethane 0.50 U 56-23-5				
75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5	75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 75-3-5				
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106-93-41,2-Dibromoethane 0.50 U	106-93-41,2-Dibromoethane 0.50 U	124-48-1	Dibromochloromethane		
				0.50	U
	0.7				
	0.7			-	

FORM I VOA

EPA SAMPLE NO.

TW06

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3293

Level: (low/med) LOW

Soil Extract Volume: ____(uL)

CAS NO. COMPOUND

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

Lab Sample ID: E0468-10

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

620 00 6	0.50	
630-20-61,1,1,2-Tetrachloroethane	0.50	
100-41-4Ethylbenzene	0.50	1 -
136777-61-2m,p-Xylene	0.50	
95-47-6o-Xylene	0.50	Ŭ
100-42-5Styrene	0.50	U
75-25-2Bromoform	0.50	U
98-82-8Isopropylbenzene	0.50	U
79-34-51,1,2,2-Tetrachloroethane	0.50	U
108-86-1Bromobenzene	0.50	U
96-18-41,2,3-Trichloropropane	0.50	ט
103-65-1n-Propylbenzene	0.50	U
95-49-82-Chlorotoluene	0.50	
108-67-81,3,5-Trimethylbenzene	0.50	שו
106-43-44-Chlorotoluene	0.50	ט
98-06-6tert-Butylbenzene	0.50	Ū
95-63-61,2,4-Trimethylbenzene	0.50	Ū
135-98-8sec-Butylbenzene	0.50	Ū
541-73-11,3-Dichlorobenzene	0.50	1 -
99-87-64-Isopropyltoluene	0.50	1 -
106-46-71,4-Dichlorobenzene	0.50	i -
104-51-8n-Butylbenzene	0.50) .
95-50-11,2-Dichlorobenzene	0.50	1 -
96-12-81,2-Dibromo-3-chloropropane	0.50	1
120-82-11,2,4-Trichlorobenzene	0.50	-
87-68-3Hexachlorobutadiene	0.50	_
91-20-3Naphthalene	0.50	ŧ
87-61-61,2,3-Trichlorobenzene	0.50	, ~
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FORM I VOA

EPA SAMPLE NO.

TW 07	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-13

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3296

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

75-71-8Dichlorodifluoromethane 0.50 U 74-87-3Chloromethane 0.50 U 75-01-4Vinyl Chloride 0.50 U	
74-87-3Chloromethane 0.50 U 75-01-4Vinyl Chloride 0.50 U	
75-01-4Vinyl Chloride 0.50 U	- 1
	1
74-83-9Bromomethane 0.50 U	
75-00-3Chloroethane 0.50 U	
75-69-4Trichlorofluoromethane 0.50 U	
75-35-41,1-Dichloroethene 0.50 U	
75-09-2Methylene Chloride 0.50 U	
156-60-5trans-1,2-Dichloroethene 0.50 U	
1634-04-4Methyl tert-butyl ether 0.66 X	
75-34-31,1-Dichloroethane 0.50 U	-1
156-59-2cis-1,2-Dichloroethene 0.50 U	
590-20-72,2-Dichloropropane 0.50 U	
107-06-21,2-Dichloroethane 0.50 U	
74-97-5Bromochloromethane 0.50 U	
67-66-3Chloroform 0.50 U	
56-23-5Carbon Tetrachloride 0.50 U	
71-55-61,1,1-Trichloroethane 0.50 U	
563-58-61,1-Dichloropropene 0.50 U	
79-01-6Trichloroethene 0.50 U	
78-87-51,2-Dichloropropane 0.50 U	
71-43-2Benzene 0.50 U	1 .
74-95-3Dibromomethane 0.50 U	
75-27-4Bromodichloromethane 0.50 U	
10061-01-5cis-1,3-Dichloropropene 0.50 U	
108-88-3Toluene 0.50 U	
10061-02-6trans-1,3-Dichloropropene 0.50 U	
79-00-51,1,2-Trichloroethane 0.50 U	
127-18-4Tetrachloroethene 2.1	\ \langle
142-28-91,3-Dichloropropane 0.50 U	
124-48-1Dibromochloromethane 0.50 U	
106-93-41,2-Dibromoethane 0.50 U	
108-90-7Chlorobenzene 0.50 U	

EPA SAMPLE NO.

TW07

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-13

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3296

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec.

ID: 0.25 (mm)

Date Analyzed: 04/06/98

GC Column: DB-624

CAS NO.

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	
100-41-4Ethylbenzene	0.50	I -
	0.50	•
136777-61-2m,p-Xylene		_
95-47-6o-Xylene	0.50	
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	1 -
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	, –
96-18-41,2,3-Trichloropropane	0.50	U
103-65-1n-Propylbenzene	0.50	U
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	Ū
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	
541-73-11,3-Dichlorobenzene	0.50	
99-87-64-Isopropyltoluene	0.50	-
106-46-71,4-Dichlorobenzene	0.50	_
104-51-8n-Butylbenzene	0.50	
95-50-11,2-Dichlorobenzene	0.50	_
96-12-81,2-Dibromo-3-chloropropane	0.50	_
120-82-11,2,4-Trichlorobenzene	0.50	_
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	_
87-61-61,2,3-Trichlorobenzene	0.50	_
o, or or energy and en	0.50	١
	l	ــــــــــــــــــــــــــــــــــــــ

FORM I VOA

EPA SAMPLE NO.

80WT

Lab Name: MITKEM CORP.

Lab Code: MITKEM

Contract:

SAS No.:

Matrix: (soil/water) WATER

Lab Sample ID: E0468-14

Sample wt/vol: 25.00 (g/mL) ML

Case No.:

Lab File ID: V5A3297

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

SDG No.: E0468

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO. COMPOUND

75-71-8Dichlorodifluoromethane	0.50	U
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	•
156-60-5trans-1,2-Dichloroethen		
1634-04-4Methyl tert-butyl ether		
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane		
107-06-21,2-Dichloroethane		
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform		
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.50	
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene		
78-87-51,2-Dichloropropane		
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene		
108-88-3Toluene	0.50	1
10061-02-6trans-1,3-Dichloroprope		
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	1
142-28-91,3-Dichloropropane	0.50	1
124-48-1Dibromochloromethane	0.50	1
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	
		-
		1

EPA SAMPLE NO.

80WT

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-14

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3297

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: (uL)

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

<u> </u>		
630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	_
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	_
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	_
106-43-44-Chlorotoluene	0.50	_
98-06-6tert-Butylbenzene	0.50	_
95-63-61,2,4-Trimethylbenzene	0.50	_
135-98-8sec-Butylbenzene	0.50	_
541-73-11,3-Dichlorobenzene	0.50	_
99-87-64-Isopropyltoluene	0.50	_
106-46-71,4-Dichlorobenzene	0.50	_
104-51-8n-Butylbenzene	*	_
95-50-11,2-Dichlorobenzene	0.50 0.50	_
96-12-81,2-Dibromo-3-chloropropane	0.50	_
120-82-11,2-Dibromo-3-Chroropropane_	0.50	_
87-68-3Hexachlorobutadiene	0.50	_
91-20-3Naphthalene	0.50	_
87-61-61,2,3-Trichlorobenzene	0.50	
1,2,5-111Ch1010behzehe	0.50	U
		l

EPA SAMPLE NO.

TW150

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-05

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3288

Level: (low/med) LOW Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	IJ
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	1.7	•
156-59-2cis-1,2-Dichloroethene	0.50	ŢŢ
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	_
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	1.2	-
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	U
78-87-51,2-Dichloropropane	14	
71-43-2Benzene	0.50	<u>u</u>
74-95-3Dibromomethane	0.50	U
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	U

FORM I VOA

EPA SAMPLE NO.

TW150

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3288

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

Lab Sample ID: E0468-05

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

		T
630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	1 -
95-47-6o-Xylene	0.50	-
100-42-5Styrene		ł
75-25-2Bromoform	0.50	1
	0.50	1 -
98-82-8Isopropylbenzene	0.50	1 -
79-34-51,1,2,2-Tetrachloroethane	0.50	1
108-86-1Bromobenzene	0.50	4
96-18-41,2,3-Trichloropropane	2.0	
103-65-1n-Propylbenzene	0.50	Ū
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	Ū
98-06-6tert-Butylbenzene	0.50	lυ
95-63-61,2,4-Trimethylbenzene	0.50	Ιττ
135-98-8sec-Butylbenzene	0.50	Ιττ
541-73-11,3-Dichlorobenzene	0.50	T .
99-87-64-Isopropyltoluene	0.50	1
106-46-71,4-Dichlorobenzene	0.50	-
104-51-8n-Butylbenzene	0.50	_
95-50-11,2-Dichlorobenzene	0.50	~
96-12-81,2-Dibromo-3-chloropropane	0.50	_
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	~
87-61-61,2,3-Trichlorobenzene	0.50	Įυ

EPA SAMPLE NO.

TW151

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-06

Sample wt/vol:

25.00 (g/mL) ML

LOW

Lab File ID:

V5A3289

Level:

(low/med)

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

		- 1
75-71-8Dichlorodifluoromethane	0.50 U	
74-87-3Chloromethane	0.50 U	
75-01-4Vinyl Chloride	0.50 U	
74-83-9Bromomethane	0.50 U	
75-00-3Chloroethane	0.50 U	
75-69-4Trichlorofluoromethane	0.50 U	1
75-35-41,1-Dichloroethene	0.50 U	
75-09-2Methylene Chloride	0.50 U	1
156-60-5trans-1,2-Dichloroethene	0.50 U	
1634-04-4Methyl tert-butyl ether	0.50 U	
75-34-31,1-Dichloroethane	0.48 J	
156-59-2cis-1,2-Dichloroethene	0.50 บ	
590-20-72,2-Dichloropropane	0.50 U	
107-06-21,2-Dichloroethane	0.50 U	
74-97-5Bromochloromethane	0.50 11	
67-66-3Chloroform	0.62	
56-23-5Carbon Tetrachloride	0.50 U	1
71-55-61,1,1-Trichloroethane	2.2	1.
563-58-61,1-Dichloropropene	0.50 ប	
79-01-6Trichloroethene	0.50 U	
78-87-51,2-Dichloropropane	0.50 U	1
71-43-2Benzene	0.50 U	1
74-95-3Dibromomethane	0.50 U	
75-27-4Bromodichloromethane	0.50 บ	Ì
10061-01-5cis-1,3-Dichloropropene	0.50 U	ŀ
108-88-3Toluene	0.50 U	
10061-02-6trans-1,3-Dichloropropene	0.50 U	
79-00-51,1,2-Trichloroethane	0.50 U	
127-18-4Tetrachloroethene	0.50 U	
142-28-91,3-Dichloropropane	0.50 U	1
124-48-1Dibromochloromethane	0.50 U	1
106-93-41,2-Dibromoethane	0.50 U	
108-90-7Chlorobenzene	0.50 U	1
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FORM I VOA

EPA SAMPLE NO.

TW151

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-06

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3289

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	ΤŢ
100-41-4Ethylbenzene	0.50	ŧ
136777-61-2m,p-Xylene	0.50	-
95-47-6	0.50	
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	_
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene	0.50	
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	Ū
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	IJ
95-50-11,2-Dichlorobenzene	0.50	U
96-12-81,2-Dibromo-3-chloropropane	0.50	U
120-82-11,2,4-Trichlorobenzene	0.50	บ
87-68-3Hexachlorobutadiene	0.50	1
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	

FORM I VOA

EPA SAMPLE NO.

TW152

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No

SAS No.: SDG No.: E0468

Matrix: (soil/water) WATER Lab Sample ID: E0468-07

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3290

Level: (low/med) LOW Date Received: 04/06/98

% Moisture: not dec. _____ Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

75-71-8Dichlorodifluoromethane	0.50	u
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	_
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	1
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.68	
75-34-31,1-Dichloroethane	0.50	⊕
156-59-2cis-1,2-Dichloroethene	0.50	-
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.53	, —
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.42	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
	0.50	
106-93-41,2-Dibromoethane 108-90-7Chlorobenzene		υ
100-30-1Curoropeuseue	0.50	ا ا
	\.	!

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EPA SAMPLE NO.

TW152

Lab Name: MITKEM CORP.

Contract:

ab Code: MITKEM Case No.: SAS No.: SDG No.: E0468

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E046

Matrix: (soil/water) WATER Lab Sample ID: E0468-07

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3290

Level: (low/med) LOW Date Received: 04/06/98

% Moisture: not dec. ____ Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

		
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	מממממממממממממממממממממממממממממממממממממממ
104-51-8n-Butylbenzene 95-50-11,2-Dichlorobenzene	0.50 0.50	บ บ บ บ บ

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EPA SAMPLE NO.

TW153

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-11

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3294

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

	T	
75-71-8Dichlorodifluoromethane	0.50	U
74-87-3Chloromethane	0.50	U
75-01-4Vinyl Chloride	0.50	U
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	U
75-69-4Trichlorofluoromethane	0.50	U
75-35-41,1-Dichloroethene	0.50	U
75-09-2Methylene Chloride	0.50	U
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	ט
75-34-31,1-Dichloroethane	0.50	U
156-59-2cis-1,2-Dichloroethene	0.50	Ŀ
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	1
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.80	
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	U
71-43-2Benzene	0.50	U
74-95-3Dibromomethane	0.50	U
75-27-4Bromodichloromethane	0:50	U
10061-01-5cis-1,3-Dichloropropene	0.50	U
108-88-3Toluene	0.50	ប
10061-02-6trans-1,3-Dichloropropene	0.50	U
79-00-51,1,2-Trichloroethane	0.50	U
127-18-4Tetrachloroethene	0.50	שו
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	U
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	U

EPA SAMPLE NO.

TW153

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-11

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3294

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec. _____

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene	0.50 0.50 0.50	U
95-47-6o-Xylene 100-42-5Styrene	0.50 0.50	U
75-25-2Bromoform 98-82-8Isopropylbenzene 79-34-51,1,2,2-Tetrachloroethane	0.50 0.50 0.50	ប
108-86-1Bromobenzene 96-18-41,2,3-Trichloropropane	0.50 0.50	U U
103-65-1n-Propylbenzene 95-49-82-Chlorotoluene 108-67-81,3,5-Trimethylbenzene	0.50 0.50 0.50	บ
106-43-44-Chlorotoluene 98-06-6tert-Butylbenzene	0.50 0.50	U U
95-63-61,2,4-Trimethylbenzene 135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene	0.50 0.50 0.50	บ
99-87-64-Isopropyltoluene 106-46-71,4-Dichlorobenzene	0.50 0.50 0.50	U
104-51-8n-Butylbenzene 95-50-11,2-Dichlorobenzene 96-12-81,2-Dibromo-3-chloropropane	0.50 0.50 0.50	Ū
120-82-11,2,4-Trichlorobenzene 87-68-3Hexachlorobutadiene 91-20-3Naphthalene	0.50 0.50 0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	

FORM I VOA

EPA SAMPLE NO.

TW154

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-12

Sample wt/vol:

Lab File ID:

25.00 (g/mL) ML

V5A3295

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec. ___

Soil Extract Volume: (uL)

ID: 0.25 (mm)

Date Analyzed: 04/06/98

GC Column: DB-624

CAS NO.

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50	TT
	Chloromethane	0.50	-
	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
75-34-3	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	
	1,2-Dichloroethane	0.50	
	Bromochloromethane	0_50	
	Chloroform	0.5 0.32	
56-23-5	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	U
	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	
71-43-2		0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.39	J
	trans-1,3-Dichloropropene	0.50	
	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.50	
142-28-9	1,3-Dichloropropane	0.50	
	Dibromochloromethane	0.50	_
	1,2-Dibromoethane	0.50	
108-90-7	Chlorobenzene	0.50	U
		1.20	

-130

EPA SAMPLE NO.

TW154

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-12

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3295

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec. _____

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	ΤT
100-41-4Ethylbenzene	0.50	1
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	1
75-25-2Bromoform		_
	0.50	_
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	-
96-18-41,2,3-Trichloropropane	0.50	-
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dicĥlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	Ū
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	_
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	
	0.50	_

FORM I VOA

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TB01

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.

Lab Code: MITKEM Case No.:

SAS No.:

Contract:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-01

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3298

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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.6. .7.		-	<u> </u>	
8.		-		
.9.				
· 				
iZ.				
iJ.				
24.		-		
25.		-		
27				
10.		-		
i9.				
30				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW01

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Lab Code: MITKEM	Case No.:	SAS No.:	SDG No.: E0468
Matrix: (soil/water)	WATER	Lab	Sample ID: E0468-02
Sample wt/vol:	25.00 (g/mL) ML	Lab	File ID: V5A3285

Contract:

% Moisture: not dec. _____ Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL) Soil Extract Volume: (uL)

> CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Date Received: 04/06/98

Number TICs found: 0

Lab Name: MITKEM CORP.

Level: (low/med) LOW

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
4.				
3.				
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8. 9.				
10.				
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12.				
1 14.				
15			***************************************	
16. 17.				
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20.				
22.	***************************************			
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24.		· 		
20.				
7.1.				
28.				
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FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW	02	
		- 1

Lah	Name ·	MITKEM	CCDDD
	TACHILL .	1.17.7.17.1	COLU.

Contract:

Lab Code: MITKEM Case No.:

SAS No.: SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-03

Sample wt/vol: 25.00 (q/mL) ML

Lab File ID: V5A3286

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec. _____

Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) ug/L CAS NUMBER RTCOMPOUND NAME --------======

EST. CONC. 6.0 JR 1. UNKNOWN 14.63 9. 10. 11.____ 12.___ 13. 15. 16. 17. 18. 19. 20. 21.__ 22.___ 23.__ 24. 25. 26. 27._ 28. 29. 30.

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EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TW03

Lab Name:	MITKEM	CORP.
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Contract:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-04

Sample wt/vol: 25.00 (g/mL) ML

Lab Code: MITKEM

Case No.:

Lab File ID:

V5A3287

Level:

(low/med) LOW

Date Received: 04/06/98

% Moisture: not dec. _____

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT ======	EST. CONC.	Q
1 1.				
2. 3. 4.				
6.				
8.				
10.				
11.				
14.				
16.				
17. 18. 19.				
20.				
22.				
25.				
26. 27.				
28.				
30				

FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO
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TW04	

Lab Name:	MITKEM	CORP
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Sample wt/vol:

Lab File ID:

V5A3291

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

Lab Sample ID: E0468-08

GC Column: DB-624

ID: 0.25 (mm)

25.00 (g/mL) ML

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME		EST. CONC.	
		- ======		====
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7		-		
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12.		_		
13.		-		
	-			
±2.		-		
16. 17.		_	 	
10		_		
10.		_		
19.		_		I
20				I
21		-		l
44.		-		l
23.		_		l
24.		-		
25.		_		
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27.		-		
28		_		
23.				
30.		_		
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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

	TW05		
,	TW05		

Lab Name: MITKEM Co)RP	
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Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-09

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3292

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec. _____

Date Analyzed: 04/06/98

ID: 0.25 (mm)

Dilution Factor: 1.0

GC Column: DB-624 Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25.				
26. 27. 28. 29.				

FORM I VOA-TIC

1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW 06

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab File ID:

Sample wt/vol:

25.00 (g/mL) ML

V5A3293

Level: (low/med)

LOW

Date Received: 04/06/98

Lab Sample ID: E0468-10

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2. 3.	UNKNOWN	14.41	0.53	FR ———
4				
6. 7. 8.				
9. 10. 11.				
12. 13. 14.				
16. 17. 18.			· · · · · · · · · · · · · · · · · · ·	
19. 20. 21.				
22. 23. 24.				
25. 26. 27.				
28. 29. 30.				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

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EPA SAMPLE NO.

Lab Name: 1	MITKEM (${\tt CORP}$.
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

25.00 (g/mL) ML

Sample wt/vol:

LOW

Lab File ID:

V5A3296

Level:

(low/med)

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Lab Sample ID: E0468-13

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

Number TICs found: 0

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q =====
1.				
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9.	· · · · · · · · · · · · · · · · · · ·			
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11. 12.				ļ ——
10.				
14.				
15				
16.				
10.				
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23.			·	
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30.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

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TW08	

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab File ID: V5A3297

Sample wt/vol: 25.00 (g/mL) ML

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec. _____

Date Analyzed: 04/06/98

Lab Sample ID: E0468-14

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
2				
3				
4		·		
6				
7				
0.				
9.				
10.				
14.				
13.				
17.				
15. l				
10.				
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20.				
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23.				
24				
25				
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27				<u>-</u>
28.				
30.				
30	· · · · · · · · · · · · · · · · · · ·			

FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-05

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3288

Level: (low/med) LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	14.52	1.2	т.К
2. 3.				
4. 5.				
0.				
7. 8.				
9				
13.				
15.				
16.				
18.				
20.				
21.				
23.				
25.			·	
26. 27.				
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29.				
•				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW151	

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-06

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V5A3289

Level: (low/med) Date Received: 04/06/98

% Moisture: not dec.

Number TICs found: 1

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20.		1	EST. CONC.	====
22. 23. 24. 25. 26. 27. 28. 29.				

FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW152	
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Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-07

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3290

(low/med) Level:

LOW

Date Received: 04/06/98

% Moisture: not dec. ____

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW153	
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Lab Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-11

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3294

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec. _____

ID: 0.25 (mm)

Dilution Factor: 1.0

Date Analyzed: 04/06/98

GC Column: DB-624 Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME		EST. CONC.	
1		-		=====
1		-	***************************************	
3		_		l
4	· · · · · · · · · · · · · · · · · · ·	_		
5				
0.				
/.				
8.		_		
J.				
10.		_		
11.				
12.				
13.				l ———
14.		_		
TJ.		-		
16. 17.				
18.	A STATE OF THE STA			
19.				-
20.				
21.				
22.				
23 I			•	<u></u> -
24. i		_		
4.J.		_		
26.				
		_	·	<u> </u>
20.		_		
4).		_		
30.				
				l

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW154	
-------	--

Lab Name: M	ITKEM CORP
-------------	------------

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0468

Matrix: (soil/water) WATER

Lab Sample ID: E0468-12

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3295

Level: (low/med)

LOW

Date Received: 04/06/98

% Moisture: not dec.

Date Analyzed: 04/06/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	ł
1. 2. 3. 4. 5. 6. 7. 8. 9.		1	===========	ł
12. 13. 14. 15. 16. 17.				
20. 21. 22. 23. 24. 25. 26. 27. 28. 29.				

FORM I VOA-TIC



Appendix D Region II Work Sheet

US EPA Region II

Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

YES NO N/A

PACKAGE COMPLETENESS AND DELIVERABLES

	۸		
CASE NUMBER: 2500 LABORATORY: Mitkew Con	<u>, </u>		
SITE NAME: Smith Town, Long Island SDG Number (8): 5046	<u> </u>		
1.0 Chain of Custody and Sampling Trip Reports			
1.1 Are the Traffic Reports/Chain-of-Custody Records present for all samples?	1		_
ACTION: If no, contact lab for replacement of missing or illegible copies.			
1.2 Is the Sampling Trip Report present for all samples and all fractions?	14		_
ACTION: If no, contact either RSCC or the prime contractor for this information.			
2.0 <u>Data Completeness and Deliverables</u>			
2.1 Have any missing deliverables been received and added to the data package?			
NOTE: The lab is required to submit data for only two analyses, for each fraction. (i.e., the original sample and one dilution, or, from the most concentrated dilution analyzed and one further dilution.)			
ACTION: Call lab for an explanation or resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the package under the Contract Non- compliance section of the Data Assessment and the Organic Regional Data Assessment summary.			
2.2 Was CLASS CCS checklist included with package?			<u>L</u>
2.3 Are there any discrepancies between the Traffic Reports/Chain-of-Custody Records, Sampling Report and Sample Tags?		Ц́	
ACTION: If yes, contract the laboratory for an explanation or resubmittal of any missing			

deliverables.

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Method: CLP/SOW OLMO3.1

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				YES	NO	N)
3.0	Cover 1	<u> Letter </u>	SDG Narrative		٠.	
	3.1	Is the	Narrative or Cover Letter Present?	14		
	3.2		se Number and/or SAS number contained in rrative or Cover letter?	ГŢ		
	3.3	Does thinformation	ne narrative contain the following ation:			
		VOA:	description of trap and columns used during sample analyses?	ц		
		BNA:	description of columns used during sample analyses?	П		_
	·	Pest:	description of columns used during sample analyses?			
	NOTE:	As p Pack	er section 6.23.3.1 SOW/p. D-11/Pest, ed columns are not permitted.			
	3.4	contai	he narrative, VOA and BNA sections, n a list of all TICs identified as alkanes eir estimated concentrations?			×
	3.5	temper exceed	he narrative contain a record of all cooler atures? If the temperature of a cooler was ed, > 10°C, the lab must list by fraction mple number, all affected samples.	П	<u>v</u>	·
	3.6	values	he narrative contain a list of the pH determined for each water sample submitted platile analysis?	<u>.</u>		, <
	3.7	Does t	the Case Narrative contain the statement, atim", as required in Section B of the SOW?	1/1		
	ACTIO	cont resi doci	No", to any question in this section, act the laboratory for all necessary abmittals. If information is not available, ament in the Data Assessment under olems/Non-Compliance section.			

A This information was found in The other section

US EPA Region II

Method: CLP/SOW OLMO3.1

Date: October 1995

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YES NO N/A

4.0 Data Validation Checklist

BNA Data?

Pesticide/PCB data?

4.1	Check the package for the following discrepancies:		-
	a. Is the package paginated in ascending order starting from the SDG narrative?	Ľí	
	b. Are all forms and copies legible?	IN	
	c. Is each fraction assembled in the order set forth in the SOW?	ГŢ	
	d. Is a Sample Data Summary Package submitted immediately preceding the Sample Data Package?	ц	
	The following checklist is divided into three parts. Part A is for any VOA analyses, Part B is for BNAs and Part C is Pesticide/PCBs.		,
	Does this package contain:		
	VOA Data?		

ACTION: Complete corresponding parts of checklist.

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Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

YES NO 1

PART A: VOA ANALYSES

1.0 Sample Conditions/Problems

1.1 Do the Traffic Reports/Chain-of-Custody Records, Sampling Report or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50% - 90% water, all data should be flagged as estimated "J". If a soil sample other than TCLP contains more than 90% water, all data should be qualified as unusable "R".

ACTION: If samples were not iced or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), then flag all positive results with a "J" and all non-detects "UJ".

ACTION: If both VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: The smallest soil size permitted is 0.5g. If any soil sample is smaller than 0.5g, document in the Data Assessment under Contract Problems/Non-Compliance.

2.0 Holding Times

2.1 Have any VOA technical holding times, determined from date of collection to date of analysis, been exceeded?

Technical Holding Times: If unpreserved, aqueous samples, maintained at 4° C for aromatic hydrocarbons analysis must be analyzed within 7 days of collection. If preserved with HCl (pH < 2) and stored at 4° C, then aqueous samples must be analyzed within 14 days of collection. If uncertain about preservation, contact sampler to determine whether or not samples were preserved. The holding time for soils is 10 days from date of collection.

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YES NO N/A

Table of Holding Time Violations (See Chain-of-Custody Records)

Sample ID	Sample Matrix	Was Sample Preserved?	Date Sampled	Date Lab Received	Date Analyzed
					·
		-	·		
					· · · · · · · · · · · · · · · · · · ·

ACTION: If technical holding times are exceeded, flag all positive results as estimated "J" and sample quantitation limits as estimated "UJ", and document in the Data Assessment that holding times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results must be qualified "J", but the reviewer may determine that non-detect data are unusable "R". If holding times are exceeded by more than 28 days, all non detect data are unusable "R".

NOTE: Contractual Holding Times: Analysis of water and soil/sediment samples must be completed within 10 days of Validated Time of Sample Receipt (VTSR). This requirement does not apply to Performance Evaluation (PE) samples.

ACTION: If contractual holding times are exceeded, document in the Data Assessment and on the Organic Regional Data Assessment Summary form.

NOTE: The data reviewer must note in the Data Assessment whether or not technical and contractual holding times were met.

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US EPA Region II

Date: October 1995 SOP HW-6. Rev. 10

Meti	od: CLI	P/SOW OLMO3.1	SOP	HW-6	, Rev	. 10
			-	YES	NO	N
3.0	System	Monitoring Compound (SMC) Recovery (Form II)				
	3.1	Are the VOA SMC Recovery Summaries (Form II) present for each of the following matrices:				
		a. Low Water?		17		
		b. Low Soil?				
		c. Med Soil?		П		
	3.2	Are all the VOA samples listed on the appropria System Monitoring Compound Recovery Summary for each of the following matrices:	ate r			
		a. Low Water?		19	<u> </u>	
		b. Low Soil?				~
		c. Med Soil?				_/
	ACTIO	N: Call lab for explanation/resubmittals. If missing deliverables are unavailable, docume effect in the Data Assessments.	nt			
	3.3	Were outliers marked correctly with an asteris	k?			_
	ACTIO	N: Circle all outliers in red.				
	3.4	Was one or more VOA system monitoring compound recovery outside of contract specifications fo any sample or method blank?	r		<u></u>	
		If yes, were samples re-analyzed?				
		Were method blanks re-analyzed?				
	ACTIO	ON: If recoveries are > 10%, but 1 or more compounds fail to meet SOW specifications:				
		1. All positive results are qualified as				

- 1. All positive results are qualified as estimated "J".
- 2. Flag all non-detects as estimated detection limits "UJ" where recovery is less than the lower acceptance limit.
- 3. If SMC recoveries are above allowable levels, do not qualify non-detects.

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YES NO N/A

If any system monitoring compound recovery is < 10%:

- 1. Flag all positive results as estimated "J".
- 2. Flag all non-detects as unusable "R".

Professional judgement should be used to qualify data that only have method blank SMC recoveries out of specification in both original and re-analyses. Check the internal standard areas.

NOTE: Contractual requirements state that if any SMC fails the acceptance criteria, the sample must be re-analyzed. If the affected sample was not re-analyzed, document in the Data Assessment under Contract Problems/Non-Compliance.

NOTE: The laboratory must submit the following data:
1. If SMC recoveries and internal standard
responses meet the acceptance criteria in the reanalyzed sample, then the laboratory must submit
only the re-analysis.

2. If an SMC recovery and/or internal standard response fails to meet the acceptance criteria upon re-analysis, then submit data from both analyses.

(Refer to section 11.4.3.2, page D-46/VOA of the SOW for more information.)

3.5 Are there any transcription/calculation errors between raw data and Form II?

<u> — гд –</u>

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and note errors in the Data Assessment.

4.0 Matrix Spikes (Form III)

4.1 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form (Form III) present?

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	••			YES	NO	N
	4.2	Were matrix spikes analyzed a frequency for each of the fol	at the required			
		a. Low Water?	LIOWING MACTICOS.		<u>~</u>	
		b. Low Soil?				
		c. Med Soil?		П		$\frac{\nu}{}$
	ACTION	I: If any matrix spike data an action specified in 3.2 abo	re missing, take the ove.			
	4.3	How many VOA spike recoveries limits?	s are outside QC			
		<u>Water</u> <u>So</u>	oils <i>Na</i> 1	anal	True d	
		out of 10	out of 10	(300 1	
	4.4	How many RPDs for matrix spil duplicate recoveries are out	ke and matrix spike side QC limits?			
		<u>Water</u> <u>S</u>	<u>oils</u>			
		out of 5	out of 5			
	ACTIO	N: No action is taken based unalone. However, using infindgement, the MS/MSD resusion with other QC the need for qualification	ormed professional lts may be used in criteria to determine			
	ACTIO	N: Circle all outliers in red	l .			
5.0	Blanks	(Form IV)		<u> </u>		
	5.1	Is the Method Blank Summary	(Form IV) present?			
	5.2	Frequency of Analysis: for to TCL compounds, has a reagent analyzed for each SDG or eve similar matrix (low water, l soil), whichever is more free	:/method blank been ery 20 samples of ow soil or medium	ц		
	5.3	Has a VOA method blank been once every twelve hours for level and GC/MS system used?	each concentration	<u>~</u>		•

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YES NO N/A

		YES	NO	N/A
5.4	Was a VOA instrument blank analyzed after each sample/dilution which contained a target compound that exceeded the initial calibration range?	Ļ	· .	· V
5.5	Was a VOA storage blank analyzed at the end of all samples for each SDG in a case?	ГД		
ACTIO	N: If any method/instrument blank data are missing, call lab for explanation or resubmittal. If method blank data are not available, reject "R" all associated positive data. However, using professional judgement, the data reviewer may substitute field blank or trip blank data for missing method blank data.			
	If any instrument blank analyzed after a sample with high concentration is missing, contact the lab for resubmittals. If the instrument blank was not analyzed or not available, inspect the chromatogram of the sample analyzed immediately after this analysis for possible carryover. Use professional judgement to determine if any contamination occurred and qualify analyte(s) accordingly.			
	If storage blank data is missing, contact the lab for the data. If unavailable, note in the Data Assessment under Contract Problems/Non-Compliance.			
5.6	The validator should verify that the correct identification scheme for the EPA Blank samples were used. See page B-33, section 3.3.7.3 of the SOW for further information.			
	Was the correct identification scheme used for all VOA blanks?	М		
ACTIO	ON: Contact the lab for resubmittals or make the required corrections on the forms. Document in the Data Assessment under Contract Problems/ Non-compliance if corrections were made by the validator.			
5.7	Chromatography: review the blank raw data-chromatograms (RICs), quant reports or data system printouts and spectra. Is the chromatographic performance (baseline stability) for each instrument acceptable for VOAs?	ų		

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YES NO N

ACTION: Use professional judgement to determine the effect on the data.

5.8 Are all detected hits for target compounds in method and instrument blanks less than the CRQL for that analyte?

Exception: Acetone and 2-butanone must be less than 5 times the CRQL, and methylene chloride must be less than 2.5 times its CRQL.

ACTION: If yes, an explanation and laboratory's corrective actions must be addressed in the case narrative. If the narrative contains no explanation, then make note in the Data Assessment under Contract Problems/Non-Compliance.

6.0 Contamination

NOTE: "Water blanks", "drill blanks", and "distilled water blanks" are validated like any other sample, and are <u>not</u> used to qualify data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent/storage blanks have positive results (TCL and/or TIC) for VOAs?

NOTE: When applied as directed in the table below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for *moisture when necessary.

NOTE: A contaminated instrument blank is not allowable under this SOW. See page D-48/VOA, section 12.1.2.4 for additional information. Document in the Data Assessment under Contract Problems/Non-Compliance if contaminated instrument blank was submitted.

6.2 Do any field/trip/rinse blanks have positive VOA results (TCL and/or TIC)?

✓ <u>।</u>

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

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YES N/A NO

NOTE: All field blank results associated with a particular group of samples (may exceed one per case) must be used to qualify data. Trip blanks are used to qualify only those samples with which they were shipped and are not required for non-aqueous matrices. Blanks may not be qualified because of contamination in another blank. Field Blanks & Trip Blanks must be qualified for system monitoring compound, instrument performance criteria, spectral or calibration QC problems.

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks. If any blanks are grossly contaminated, all associated data should be qualified as unusable "R".

For:	Flag sample result with a "U" when:	Report CRQL & qualify "U" when:	No qualification is needed when:
Methylene Chloride Acetone Toluene 2-Butanone	Sample conc. is > CRQL, but < 10x blank value.	Sample conc. is < CRQL and < 10x blank value.	Sample conc. is > CRQL and > 10x blank value.
Other Conta- minants	Sample conc. is > CRQL, but < 5x blank value.	Sample conc. is < CRQL and < 5x blank value.	Sample conc. is > CRQL and > 5x blank value.

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

ACTION: For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R". Tr.P BIK

Are there field/rinse/equipment blanks associated 6.3 with every sample?

ACTION: For low level samples, note in the Data Assessment that there is no associated field/rinse/equipment blank. For samples with

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YES NO N

high concentrations of suspected blank contaminants, use professional judgement to qualify these values and make a note in the Data Assessment.

Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0	GC/MS	Instrument	Performance	Check_	(Form	V)

for each twelve hour shift?

7.1	Are the	GC/MS	Instru	ment	Performance	Check	Forms
	(Form V) prese	ent for	Brom	nofluorobenze	ene (Bl	?B)?

7.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided

7.3 Has an instrument performance check been analyzed for every analytical sequence on each instrument?

ACTION: List date, time, instrument ID, and sample analysis for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
			

ACTION: If lab cannot provide the missing data, reject "R" all data generated outside an acceptable twelve hour calibration interval.

7.4 Have the ion abundances been normalized to m/z 95?

ACTION: If mass assignment is in error, qualify all associated data as unusable "R".

7.5 Have the ion abundance criteria been met for each instrument used?

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

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YES NO N/A

	ACTION	I: If ion abundance criteria are not met, the Region II TPO must be notified.			
	7.6	Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values, but if errors are found check more.)		মে	
	7.7	Is the number of significant figures for the reported relative abundances consistent with the number given for each ion in the ion abundance criteria column?	īΑ		
ACTI	ON:	If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document any effects in the Data Assessments.			
	7.8	Are the spectra of the mass calibration compound acceptable?	प्त		
	ACTIO	N: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			
8.0	Target	Compound List (TCL) Analytes			
	8.1	Are the Organic Analysis Data Sheets (Form I VOA) present with required header information on each page, for each of the following:	•		
		a. Samples and/or fractions as appropriate?	1,		
		b. Matrix spikes and matrix spike duplicates?	τ.⊲		
		c. Blanks?	ŢŢ		
	8.2				
		Are the VOA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following:			
		mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the	тĄ		
		mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following:	тҳ̈́ тҳ		
		mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following: a. Samples and/or fractions as appropriate? b. Matrix spikes and matrix spike duplicates	17 17 17		

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YES NO

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ACTIO	N: If any data are missing, take action specified in 3.2 above.		•	
8.3	Are the response factors shown in the Quant Report?	ц,		
8.4	Is chromatographic performance acceptable with respect to:	,		
	a. Baseline stability?	ТŢ		
	b. Resolution?	T₹		
	c. Peak shape?	ार्य		
	d. Full-scale graph (attenuation)?	ान्		
•	e. Other:?			
ACTIO	N: Use professional judgement to determine the acceptability of the data.			
8.5	Are the lab-generated standard mass spectra of the identified VOA compounds present for each sample?	ग्त्र		_
ACTIO	ON: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate its own standard spectra, document in the Data Assessment in the Contract Non-compliance section and the Organic Regional Data Assessment Summary.			
8.6	Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	त्र		
8.7	Are all ions present in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?	<u></u>		
8.8	Do sample and standard relative ion intensities agree within $\pm 20\%$?	T.		
ACTIO	ON: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected "R", flagged "N" (presumptive evidence of the presence of the compound) or changed to not detected "U" at the			

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> N/A YES NO

calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 8.6, 8.7, and 8.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

9.0 Te

entat:	ively Identified Compounds (TIC)			•
9.1	Are all Tentatively Identified Compound Forms (Form I Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?	ц		
9.2	Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:	,		
	a. Samples and/or fractions as appropriate?	ГŢ		
	b. Blanks?	1 √1		
	c. Alkanes listed for each sample?			_
ACTIO:	N: If any TIC data are missing, take action specified in 3.2 above.		•	
ACTIO	N: Add "N" qualifier to all chemically named TICs, if missing.	·		
9.3	Are any TCL compounds (from any fraction) listed as TIC compounds? (Example: 1,2- dimethylbenzene is xylene, a VOA TCL analyte, and should not be reported as a TIC.)		<u>,</u>	
ACTIO	N: Flag with "R" any TCL compound listed as a TIC.			
9.4	Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?	ान्		
9.5	Do TIC and "best match" standard relative ion intensities agree within +20%?	[

ACTION: Use professional judgement to determine the acceptability of TIC identifications. If it is

determined an incorrect identification was

US EPA Region II Method: CLP/SOW OLMO3.1 Date: October 1995 SOP HW-6, Rev. 10

YES NO

made, change the identification to "unknown," or to some less specific identification as appropriate. (Example: "C3 substituted benzene.")

Also, when a compound is not found in any blank, but is detected in a sample and is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable "R". (E.g., Common Lab Contaminants: CO₂ (M/E 44), siloxanes (M/E 73) hexane, aldol condensation products, solvent preservatives, and related by-products - see Functional Guidelines for more guidance.)

9.6 Are TICs with responses < 10% of the internal standard (as determined by inspection of the peak areas or height) reported?

ACTION: If yes, cross out questionable TIC(s).

10.0 Compound Quantitation and Reported Detection Limits

- 10.1 Are there any transcription/calculation errors in Form I results? (Check at least two positive values. Verify that the correct internal standards, quantitation ions, and RRF were used to calculate Form I results.)
- 10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?
- ACTION: If errors are large, call the lab for explanation/resubmittals, make any necessary corrections, and note errors under Contract Problems/Non-Compliance section of the Data Assessment and the Organic Regional Data Assessment Summary.
- ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its associated value on the original Form I and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form Is

US EPA Region II Method: CLP/SOW OLMO3.1 Date: October 1995 SOP HW-6, Rev. 10

YES NO N/A

that should not be used, including any in the summary package.

11.0 Standards Data (GC/MS)

11.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant. Reports) present for initial and continuing calibration?

प्त् _ _

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

12.0 GC/MS Initial Calibration (Form VI)

12.1 Are the Initial Calibration Forms (Form VI) present and complete at concentrations of 10, 20, 50, 100, 200ng for separate calibrations of low water/med soils (unheated purge) and low soils (heated purge)?

ACTION: If any calibration standard forms are missing, take action specified in 3.2 above.

12.2 Were all low level soil standards, blanks and samples analyzed by heated purge?

ACTION: If low level soil samples were not heated during purge, qualify positive hits "J" (estimated) and non-detects "R".

12.3 Are the % relative standard deviation (%RSD) values for VOAs ≤ 30% over the concentration range of the calibration?

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ACTION: Circle all outliers in red.

NOTE: Although 11 VOA compounds have a minimum RRF and no maximum %RSD, the technical criteria are the same for all analytes.

ACTION: If %RSD is > 30.0%, qualify associated positive results for that analyte "J" and non-detects using professional judgement. When %RSD is > 90%, flag all non-detects for that analyte "R" (unusable) and positive hits "J" (estimated).

NOTE: Analytes previously qualified "U" for blank contamination are still considered as "hits" when qualifying for initial calibration criteria.

US EPA Region II Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

Method: Chr/Bon Olmoj. 2		YES	МО	N
12.4 Are any average RRFs < 0.05?			٦4	
Action: Circle all outliers in red.				
Action: If the average RRF is < 0.05, then qualify associated non-detects with an "R" and flag associated positive data as estimated "J".	g			
12.5 Are there any transcription/calculation error the reporting of average relative response factors (RRF) or %RSD? (Check at least 2 value) but if errors are found, check more.)			ц.	
NOTE: The SOW allows up to two of the <u>required</u> ana to fail %RSD or RRF criteria, provided that %RSD is ≤ 40% and the RRF is ≥ 0.010. (See Total Spage D-59/VOA or analytes marked with a "Form VI for required analytes.)	the able			
ACTION: If more than two analytes failed %RSD or R criteria, document in the Data Assessment Contract Problems/Non-Compliance and the Organic Regional Data Assessment Summary.	RF under			
13.0 GC/MS Continuing Calibration (Form VII)				
13.1 Are the Continuing Calibration Forms (Form V present and complete for separate calibratio low water/med soil and low soil samples?	II) n of	ГŢ		
13.2 Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?		ГĄ	, —	
ACTION: If any forms are missing or no continuing calibration standard has been analyzed wit twelve hours of every sample analysis, cal for explanation or resubmittal. If continuing calibration data are not available, flag a associated sample data as unusable "R".	l lab uing			
ACTION: List below all sample(s) that were not and within twelve hours of the previous contingalibration.	alyzed nuing			
				

US EPA Region II Method: CLP/SOW OLMO3.1 Date: October 1995 SOP HW-6, Rev. 10

YES NO N/A

	Do any volatile compounds have a percent
-	difference (%D) between the initial and
	continuing RRF which exceeds the ±25% criteria?

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ACTION: Circle all outliers in red.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated. When %D is > 90%, qualify all non-detects for that analyte "R" (unusable) and positive results "J" (estimated).

13.4 Are any continuing calibration RRFs < 0.05?

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ACTION: Circle all outliers in red.

ACTION: If the RRF is < 0.05, qualify the associated non-detects as unusable "R" and the associated positive values "J".

NOTE: The SOW allows up to two of the required analytes to fail %D and RRF criteria, provided that the %D is ≤ 40% and the RRF is ≥ 0.010. (See Table 5 pg. D-59/VOA or analytes marked with a "*" on Form VI for required analytes.)

ACTION: If more than two analytes failed %D and RRF, criteria document in the Data Assessment under contract Problems/Non-Compliance and on the Organic Regional Data Assessment Summary form.

13.5 Are there any transcription/calculation errors in the reporting of RRF or %D between initial and continuing RRFs? (Check at least two values, but if errors are found, check more.)

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er Skriver

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document in the Data Assessment under the Contract Problems/Non-Compliance section and the Organic Regional Data Assessment Summary.

US EPA Region II

Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

YES NO

N

14.0	Internal	Standard ((Form VIII)

14.1	Are the internal standard areas (Form VIII) of	
	every sample and blank within the upper and low	er
	limits (-50% to +100%) for each continuing	
	calibration?	

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1 ~ 1	

If no, was the sample re-analyzed?

TA ____

ACTION: 1. Circle all outliers in red.

2. List all the outliers below.

Sample #	Internal Std.	Area	Lower/Upper	Limit
				/
				/
				/
				/

(Attach additional sheets if necessary.)
(or attach copies of Form VIIIs)

ACTION: If any sample was not re-analyzed, document in the Data Assessment under Contract Problems/Non-Compliance.

ACTION: 1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

- 2. Non-detects associated with IS area counts >
 100% should not be qualified.
- 3. If the IS area in the sample is below the "lower limit," < 50%, qualify all analytes associated with that IS estimated, "J". If the area counts are extremely low, < 25% of the area in the 12 hour standard, or if performance exhibits a major abrupt drop- off, flag all associated non-detects as unusable, "R", and positive hits estimated, "J".
- 14.2 Are the retention times of the internal standards within 30 seconds of the associated calibration standard?

US EPA Region II

Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

YES NO N/A

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

NOTE: Contractual requirements state that if any internal standard fails the acceptance criteria, the sample must be re-analyzed. If the affected sample was not re-analyzed, document in the Data Assessment under Contract Problems/Non-Compliance.

NOTE: See Notes in section 3.4, page 7 for a description of sample data the laboratory must submit.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for VOA analysis?

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

* Analyged with the other butch



Appendix E Support Documentation



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Edison, New Jersey 08837-3703
908-225-6116 • Fax 908-225-7037

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM EPA CONTRACT 68-W5-0019

END OF DATA PACKAGE

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REFERENCE NO. 12



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SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM EPA CONTRACT 68-W5-0019

DATA QUALITY OBJECTIVE

DOCUMENT CONTROL NO.: START-02-F-01788 SMITH TOWN, LONG ISLAND PROJECT NO.: 2500 SDG NO.: E0475

REPORTED BY ROY F. WESTON, INC.

REVIEVED BY:

Zohreh Hamid, Ph.D.

Senior Chemist

Date

000001



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SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM EPA CONTRACT 68-W5-0019

SMITH TOWN, LONG ISLAND SITE PROJECT NUMBER: 2500 SDG No.: E0475

DISCUSSION

Thirty-one water samples including one trip blank and three sets of field duplicates were collected on 04-04-98. Mitkem Corporation Laboratory located in Warwick, Rhode Island received the samples in good condition on 04-07-98. The samples were analyzed based on EPA Method 524.2 for specific volatile target compounds.

Based on the chain-of-custody records, the following samples with laboratory IDs E0475-01 to E0475-31 were encountered in this data package:

TB02	TW15	TW155	TW162	TW169
TW09	TW16	TW156	TW163	TW170
TW10	TW17	TW157	TW164	TW171
TW11	TW18	TW158	TW165	
TW12	TW19	TW159	TW166	
TW13	TW20	TW160	TW167	
TW14	TW21	TW161	TW168	

The analysis data have been evaluated according to the USEPA Region II Functional Guidelines and the Quality Control criteria set forth in the applied Method based on the following parameters:

- Holding Time
- Calibration Analysis
- Blank Analysis
- Matrix Spike/Spike Duplicate (MS/MSD)
- Laboratory Control Sample Results
- Field Duplicate
- Instrument Performance
- Surrogate Recovery
- Internal Standard Recovery
- Compound Identification/Quantitation
- Data Package Completeness

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Smith Town, Long Island Laboratory ID Number: E0475

Page 2

Holding Time

The samples were prepared and analyzed according to the criteria set forth in the USEPA Method 524.2 for specific volatile target compounds. The samples were collected on 04-04-98 and initially analyzed on 04-07,08,09-98, within the 7-day analysis holding time. The laboratory case narrative stated that there was an accidental solvent spill in the laboratory on April 8, 1998 in which methylene chloride and freon (1,1,2-trifluoro-1,2,2-trichloroethane) contaminated samples that were analyzed on that date. The samples were reanalyzed one day outside the holding time. The reanalysis samples were free of target compound contamination. Therefore, the original sample results were reported on the data summary, and the reported results for the above compounds in the affected samples (TW166, TW167, TW168, TW169, TW170 & TW171) were considered as the laboratory contamination artifacts.

Calibration

The five point initial calibration and continuing calibration analyses were included in this data package. The %RSDs, %Ds, and response factors were within the control limits, with the exception of the response factors for 1,2-dibromo-3-chloropropane, which were below 0.05 in all initial and continuing calibrations. This compound was not detected in the samples. The non-detected values were rejected.

Blank Analysis

Methylene chloride was detected in laboratory blanks VBLK5T (0.4 ug/l) and VBLK5X (5.5ug/l). Also, the trip blank had chloroform (12 ug/L) contamination. The reported sample results up to the action levels (10X the maximum value for methylene chloride and 5x the trip blank contamination) were qualified "U" and should be considered as a non-detected value. Unknown compounds were reported in VBLK5V and storage blank at RT= 5.8 & 14.5 respectively. Also, freon was reported in VBLK5X as Tentatively Identified Compounds (TICs). The reported sample results were rejected.

Matrix Spike/Spike Duplicate Analysis

One set of matrix spike/spike duplicate analyses was performed on sample TW86. The sample was spiked with all requested target compounds. The recoveries and RPDs of the spiked compounds were within the range of 70-130% and 20% respectively.



Smith Town, Long Island Laboratory ID Number: E0475

Page 3

Laboratory Control Sample

Four laboratory control spike samples were analyzed with this batch. The recoveries were within the control limits of 80-120%.

Instrument Performance

The samples were analyzed within 12 hours from the instrument tuning with the exception of TW165, which was analyzed 21 minutes passed the analysis holding time. This sample was reanalyzed on the following day. The reanalysis data were reported on the data summary with the applied qualifier codes. The ion abundance ratios for the BFB check standard analysis were within the control limits.

Surrogate Recovery

Samples were spiked with two surrogate compounds (bromofluorobenzene and 1,2-dichlorobenzene-d4). The recoveries were within the 80-120% control limits established by the laboratory.

Internal Standard Analysis

The samples were spiked with two internal standards prior to the sample analysis. The comparison of the sample area with the corresponding daily calibration analysis demonstrated that the recoveries and the retention times of the internal standards were within the required limits.

Duplicate Analysis

Samples TW 11, TW21 & TW 169 were the field duplicates of TW10, TW 20 & TW 168 respectively. The RPDs for the detected target compounds were within the 20%.

Compound Quantitation/Identification

All samples were analyzed at one-fold dilutions. Six samples were reanalyzed due to the laboratory artifacts. The original sample data were accepted and reported on the data summary. The results for the laboratory contamination were qualified "U", and should be considered as the laboratory artifacts.

Tentatively Identified Compounds (TICs) were detected in the samples. The results were rejected due to the laboratory and storage blank contamination.



Smith Town, Long Island Laboratory ID Number: E0475

Page 4

The reported result for 1,1,1-trichloroethane in all samples was qualified estimated, since the mass spectrum did not match the reference standard.

The results below the CRQLs were qualified estimated due to the uncertainty near the detection limits.

Data Package Completeness

The data package completeness is satisfactory. The cooler temperature was within the control limits. Overall, the data quality was satisfactory. Major problems were not encountered during the sample analysis. The reported sample results were accepted with the applied qualifier codes.



- 1. Appendix A- Glossary of Data Qualifier
- 2. Appendix B- Data Summary Forms
- 3. Appendix C- Laboratory Results
- 4. Appendix D- Region II Work Sheet
- 5. Appendix E Support Documentation



Appendix A Glossary of Data Qualifier

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

- NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

 [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2- butanone in the VOA analyses, and common phthalates in the BNA analyses, along with tentatively identified compounds) or less than 5 times the blank level for other target compounds.]
- W = UNUSABLE RESULT. THE PRESENCE OR ABSENCE OF THIS ANALYTE CANNOT BE VERIFIED. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.
- NEGATED COMPOUND. THERE IS PRESUMPTIVE EVIDENCE TO MAKE A TENTATIVE IDENTIFICCATION.

CODES RELATING TO QUATITATION

(can be used for both positive results and sample quantitation limits):

- J = ANALYTE WAS POSITIVELY IDENTIFIED. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.
- UJ = ANALYTE WAS NOT DETECTED. THE REPORTED QUATITATION LIMIT IS QUALIFIED ESTIMATED.

OTHER CODES

 \mathbb{O} = NO ANALYTICAL RESULT.



Appendix B Data Summary Forms

	CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TB02 E0475-1 WATER 1.0 ug/L	TW09 E0475-2 WATER 1.0 ug/L	TW10 E0475-3 WATER 1.0 ug/L	TW11 E0475-4 WATER 1.0 ug/L	TW12 E0475-5 WATER 1.0 ug/L	TW13 E0475-6 WATER 1.0 ug/L	TW14 E0475-7 WATER 1.0 ug/L	
	TARGET COMPOUNDS:									
		Reporting								
		Limit								
	Dichlorodifluoromethane	0.5			•					
	Chloromethane	0.5								
_	Vinyl Chloride	0.5								
)	Bromomethane	0.5								
)	Chloroethane	0.5								
)	Trichlorofluoromethane	0.5								
)	1,1-Dichloroethene	0.5								
£5	Methylene Chloride	0.5								
3	trans-1,2-Dichloroethene	0.5								
	Methyl tert-butyl ether	0.5						f		
	1,1-Dichloroethane	0.5					0.46 J	•		
	cis-1,2-Dichloroethane	0.5				•				
	2,2-Dichloropropane	0.5					•			
	1,2-Dichloroethane Bromochloromethane	0.5 0.5								
	Chloroform	0.5 0.5	12					•		
	Carbon Tetrachloride	0.5 0.5	12							
	1,1,1-Trichloroethane	0.5 0.5		0.55 J			1.3 J			
	1,1-Dichloropropene	0.5		0.55 5			1.5 0			
	Trichloroethene	0.5								
	1,2-Dichloropropane	0.5 0.5		•						
	Benzene	0.5	•							
	Dibromomethane	0.5						•		
	Bromodichloromethane	0.5								
	cis-1,3-Dichloropropene	0.5		•						
	Toluene	0.5				0.34 J				
	Trans-1,3-Dichloropropene	0.5								
	1,1,2-Trichloroethane	0.5				•				
	Tetrachloroethene	0.5						0.36 J		
	1,3-Dichloropropane	0.5								
	Dibromochloromethane	0.5								
	1,2-Dibromoethane	0.5								
	Chlorobenzene	0.5		•				•		

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0475

Remarks:

Trip Blank

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TB02 E0475-1 WATER 1.0 ug/L	TW09 E0475-2 WATER 1.0 ug/L	TW10 E0475-3 WATER 1.0 ug/L	TW11 E0475-4 WATER 1.0 ug/L	TW12 E0475-5 WATER 1.0 ug/L	TW13 E0475-6 WATER 1.0 ug/L	TW14 E0475-7 WATER 1.0 ug/L
TARGET COMPOUNDS:								
	Reporting							
	Limit							•
1,1,2,2-Tetrachloroethane	0.5							
Ethylbenzene	0.5							
m,p-Xylene	0.5		:					
o-Xylene	0.5							
Styrene	0.5							
Bromoform	0.5							
sopropylbenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Bromobenzene	0.5		•					
1,2,3-Trichloropropane	0.5							
n-Propylbenzene	0.5							
2-Chlorotoluene	0.5	•						•
1,3,5-Trimethylbenzene	0.5							
4-Chlorotoluene	0.5							
tert-Butylbenzene	0.5							•
1,2,4-Trimethylbenzene	0.5		•					
sec-Butlybenzene	0.5						•	
1,3-Dichlorobenzene	0.5							
4-Isopropyltoluene	0.5			•				
1,4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5		•					
1,2-Dichlorobenzene	0.5	,						
1,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	R
1,2,4-Trichlorobenzene	0.5						•	
Hexachlorobutadiene	0.5							
Naphthalene	0.5	•						
1,2,3-Trichlorobenzene	0.5					•		

Field Duplicate

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW15 E0475-8 WATER 1.0 ug/L	TW16 E0475-9 WATER 1.0 ug/L	TW17 E0475-10 WATER 1.0 ug/L	TW18 E0475-11 WATER 1.0 ug/L	TW19 E0475-12 WATER 1.0 ug/L	TW20 E0475-13 WATER 1.0 ug/L	TW21 E0475-14 WATER 1.0 ug/L
TARGET COMPOUNDS:								
	Reporting					÷		
	Limit							
Dichlorodifluoromethane	0.5			•				
Chloromethane	0.5							
Vinyl Chloride	0.5							
Bromomethane	0.5							
Chloroethane	0.5							
Trichlorofluoromethane	0.5							
1,1-Dichloroethene	0.5		0.81	1.6				
Methylene Chloride	0.5							
rans-1,2-Dichloroethene	0.5							
Methyl tert-butyl ether	0.5					0.43 J		
1,1-Dichloroethane	0.5	0.52	2.1	4.8	1.6			
cis-1,2-Dichloroethane	0.5		0.78		•			
2,2-Dichloropropane	0.5							
1,2-Dichloroethane	0.5							
Bromochloromethane	0.5				•			
Chloroform	0.5		0.5 U	0.5 U				
Carbon Tetrachloride	0.5							
1,1,1-Trichloroethane	0.5	1.3 J	4.3 J	7 J	1.7 J			•
1,1-Dichloropropene	0.5							
Trichloroethene	0.5		1.7	2				
1,2-Dichloropropane	0.5				0.81			
Benzene	0.5							
Dibromomethane	0.5							
Bromodichloromethane	0.5							
cis-1,3-Dichloropropene	0.5							
Toluene	0.5						0.34 J	
Frans-1,3-Dichloropropene	0.5							
1,1,2-Trichloroethane	0.5							
Tetrachloroethene	0.5		5.6					
1,3-Dichloropropane	0.5							
Dibromochloromethane	0.5							
1,2-Dibromoethane	0.5							
Chlorobenzene	0.5							

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW15 E0475-8 WATER 1.0 ug/L	TW16 E0475-9 WATER 1.0 ug/L	TW17 E0475-10 WATER 1.0 ug/L	TW18 E0475-11 WATER 1.0 ug/L	TW19 E0475-12 WATER 1.0 ug/L	TW20 E0475-13 WATER 1.0 ug/L	TW21 E0475-14 WATER 1.0 ug/L
TARGET COMPOUNDS:			ALL AND VENEZUE AN					
	Reporting							
	Limit							
1,1,2,2-Tetrachloroethane	0.5			•				
Ethylbenzene	0.5							
m,p-Xylene	0.5							
o-Xylene	0.5				•			
Styrene	0.5		•					
Bromoform	0.5					•		
Isopropylbenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Bromobenzene	0.5							
1,2,3-Trichloropropane	0.5							•
n-Propylbenzene	0.5						•	
2-Chlorotoluene	0.5							
1,3,5-Trimethylbenzene	0.5							
4-Chlorotoluene	0.5							
tert-Butylbenzene	0.5							
1,2,4-Trimethylbenzene	0.5		•					
sec-Butlybenzene	0.5							
1,3-Dichlorobenzene	0.5				•			
4-isopropyitoluene	0.5							•
1,4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5		•	,				
1,2-Dichlorobenzene	0.5	•			-			_
1,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	R
1,2,4-Trichlorobenzene	0.5							
Hexachlorobutadiene	0.5		•					
Naphthalene	0.5							
1,2,3-Trichlorobenzene	0.5							

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW155 E0475-15 WATER 1.0 ug/L	TW156 E0475-16 WATER 1.0 ug/L	TW157 E0475-17 WATER 1.0 ug/L	TW158 E0475-18 WATER 1.0 ug/L	TW159 E0475-19 WATER 1.0 ug/L	TW160 E0475-20 WATER 1.0 ug/L	TW161 E0475-21 WATER 1.0 ug/L
				· · · · · · · · · · · · · · · · · · ·				
TARGET COMPOUNDS:								
	Reporting						•	
	Limit						3.2	
Dichlorodifluoromethane	0.5						3.∠	•
Chloromethane	0.5							
Vinyl Chloride	0.5		4					
Bromomethane	0.5							
Chloroethane	0.5		,				A 57	
Trichlorofluoromethane	0.5						0.57	
1,1-Dichloroethene	0.5						0.4 J	
Methylene Chloride	0.5							•
trans-1,2-Dichloroethene	0.5						•	
Methyl tert-butyl ether	0.5							
1,1-Dichloroethane	0.5	0.32 J	0.66				1.3 2.7	
cis-1,2-Dichloroethane	0.5		2.6				2.7	
2,2-Dichloropropane	0.5						•	
1,2-Dichloroethane	0.5						· .	
Bromochioromethane	0.5							
Chloroform	0.5						•	
Carbon Tetrachloride	0.5							
1,1,1-Trichloroethane	0.5	0.87 J	0.99 J				· 1.5 J	
1,1-Dichloropropene	0.5							
Trichloroethene	0.5		0.58				0.73	
1,2-Dichloropropane	0.5							
Benzene	0.5							
Dibromomethane	0.5							
Bromodichloromethane	0.5							
cis-1,3-Dichloropropene	0.5							
Toluene	0.5							
Trans-1,3-Dichloropropene	0.5							
1,1,2-Trichloroethane	0.5						9	
Tetrachloroethene	0.5		1.6			0.31 J	8.3	
1,3-Dichloropropane	0.5						•	
Dibromochloromethane	0.5							
1.2-Dibromoethane	0.5		•					
Chlorobenzene	0.5						**	

TCOOO

ANALYTICAL ASSURANCE ASSOCIATES (A3) VOLATILE ANALYSES - DATA VALIDATION SUMMARY

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0475

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS	-	TW155 E0475-15 WATER 1.0 ug/L	TW156 E0475-16 WATER 1.0 ug/L	TW157 E0475-17 WATER 1.0 ug/L	TW158 E0475-18 WATER 1.0 ug/L	TW159 E0475-19 WATER 1.0 ug/L	TW160 E0475-20 WATER 1.0 ug/L	TW161 E0475-21 WATER 1.0 ug/L
TARGET COMPOUNDS:								
TARGET GOME GONDO.	Reporting							*
	Limit							
1,1,2,2-Tetrachloroethane	0.5							
Ethylbenzene	0.5							
m,p-Xylene	0.5							
o-Xylene	0.5							
Styrene	0.5							
Bromoform	0.5							
Isopropylbenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Bromobenzene	0.5							
1,2,3-Trichloropropane	0.5							
n-Propylbenzene	0.5							•
2-Chlorotoluene	0.5							•
1,3,5-Trimethylbenzene	0.5							
4-Chlorotoluene	0.5							
tert-Butylbenzene	0.5						,,	
1,2,4-Trimethylbenzene	0.5							
sec-Butlybenzene	0.5		••					
1,3-Dichlorobenzene	0.5						•	
4-Isopropyltoluene	0.5							
1,4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5							•
1,2-Dichlorobenzene	0.5		_	_	_	_		
1,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	R
1,2,4-Trichlorobenzene	0.5							
Hexachlorobutadiene	0.5							
Naphthalene	0.5							
1,2,3-Trichlorobenzene	0.5	**						

Remarks:

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW162 E0475-22 WATER 1.0 ug/L	TW163 E0475-23 WATER 1.0 ug/L	TW164 E0475-24 WATER 1.0 ug/L	TW165RE E0475-25RE WATER 1.0 ug/L	TW166 E0475-26 WATER 1.0 ug/L	TW167 E0475-27 WATER 1.0 ug/L	TW168 E0475-28 WATER 1.0 ug/L
TARGET COMPOUNDS:								
	Reporting							
Diskins Passassassassassassassassassassassassass	Limit							
Dichlorodifluoromethane	0.5 0.5							
Chloromethane								
Vinyl Chloride Bromomethane	0.5 0.5							
Chloroethane	0.5 0.5		•					
Trichlorofluoromethane	0.5							
1,1-Dichloroethene	0.5 0.5							
Methylene Chloride	0.5 0.5				4.2 U	4.2 U	4.3 U	4.1 U
trans-1,2-Dichloroethene	0.5				1	-V.22 U	4.5 0	4.1 0
Methyl tert-butyl ether	0.5							
1,1-Dichloroethane	0.5	0.37 J					• •	
cis-1,2-Dichloroethane	0.5							
2,2-Dichloropropane	0.5							
1,2-Dichloroethane	0.5							
Bromochloromethane	0.5		•				·	
Chloroform	0.5		0.5 U				•	
Carbon Tetrachloride	0.5							
1,1,1-Trichloroethane	0.5	1.1 J				0.49 J	0.51 J	
1,1-Dichloropropene	0.5							
Trichloroethene	0.5							
1,2-Dichloropropane	0.5							
Benzene	0.5							
Dibromomethane	0.5						•	
Bromodichloromethane	0.5		*					
cis-1,3-Dichloropropene	0.5		,				0.22 1	0.24 1
Toluene	0.5						0.33 J	0.31 J
Trans-1,3-Dichloropropend	e 0.5							
1,1,2-Trichloroethane	0.5 0.5							
Tetrachloroethene 1,3-Dichloropropane	0.5 0.5							
Dibromochloromethane	0.5 0.5						•	
1,2-Dibromoethane	0.5 0.5							
Chlorobenzene	0.5 0.5							
Chichones Relie	U.S							

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0475

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW162 E0475-22 WATER 1.0 ug/L	TW163 E0475-23 WATER 1.0 ug/L	TW164 E0475-24 WATER 1.0 ug/L	TW165RE E0475-25RE WATER 1.0 ug/L	TW166 E0475-26 WATER 1.0 ug/L	TW167 E0475-27 WATER 1.0 ug/L	TW168 E0475-28 WATER 1.0 ug/L
TARGET COMPOUNDS:								
	Reporting							
	Limit							
1.1.2.2-Tetrachloroethane	0.5							
Ethylbenzene	0.5							
m,p-Xylene	0.5							
o-Xylene	0.5							
Styrene	0.5							
Bromoform	0.5							
Isopropylbenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5		•					
Bromobenzene	0.5		0					
1,2,3-Trichloropropane	0.5							
n-Propylbenzene	0.5						·	
2-Chlorotoluene	0.5							•
1,3,5-Trimethylbenzene	0.5							
4-Chlorotoluene	0.5							
tert-Butylbenzene	0.5		•					
1,2,4-Trimethylbenzene	0.5							
sec-Butlybenzene	0.5						•	
1,3-Dichlorobenzene	0.5							
4-Isopropyltoluene	0.5			•			•	
1,4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5							
1,2-Dichlorobenzene	0.5							_
1,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	R
1,2,4-Trichlorobenzene	0.5						•	
Hexachlorobutadiene	0.5							
Naphthalene	0.5							
1,2,3-Trichlorobenzene	0.5							

Remarks:

ANALYTICAL ASSUR VOLATILE ANALYSES - DJ

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW169 E0475-29 WATER 1.0 ug/L	TW170 E0475-30 WATER 1.0 ug/L	TW171 E0475-31 WATER 1.0 ug/L
TARGET COMPOUNDS:				
	Reporting			
	Limit			
Dichlorodifluoromethane	0.5			
Chloromethane	0.5			
Vinyl Chloride	0.5			
Bromomethane	0.5			
Chloroethane	0.5			
Trichlorofluoromethane	0.5			
1,1-Dichloroethene	0.5	3.8 U	4.4 U	3.8 U
Methylene Chloride	0.5	3.8 0	4.4 U	3.6 0
trans-1,2-Dichloroethene	0.5		•	
Methyl tert-butyl ether	0.5 0.5			
1,1-Dichloroethane cis-1,2-Dichloroethane	0.5 0.5			
2,2-Dichloropropane	0.5 0.5			
1,2-Dichloroethane	0.5 0.5			
Bromochloromethane	0.5		•	
Chloroform	0.5			
Carbon Tetrachloride	0.5			
1,1,1-Trichloroethane	0.5			0.56 J
1,1-Dichloropropene	0.5			. 0.000
Trichloroethene	0.5			
1,2-Dichloropropane	0.5			
Benzene	0.5			
Dibromomethane	0.5			
Bromodichloromethane	0.5			
cis-1,3-Dichloropropene	0.5			
Toluene	0.5			
Trans-1,3-Dichloropropene	0.5			
1,1,2-Trichloroethane	0.5			
Tetrachloroethene	0.5			
1,3-Dichloropropane	0.5			
Dibromochloromethane	0.5			
1,2-Dibromoethane	0.5			
Chlorobenzene	0.5			

ANALYTICAL ASSUR **VOLATILE ANALYSES - D**

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0475

CLIENT SAMPLE ID:	TW169	TW170	TW171
LAB SAMPLE ID:	E0475-29	E0475-30	E0475-31
MATRIX:	WATER	WATER	WATER
DILUTION FACTOR:	1.0	1.0	1.0
UNITS	ug/L	ug/L	ug/L

							_
T/	RG	CT	\sim	RAE	201	MR	ю.

TARGET COMPOUNDS:				
	Reporting			
	Limit			
1,1,2,2-Tetrachloroethane	0.5			
Ethylbenzene	0.5			
m,p-Xylene	0.5			
o-Xylene	0.5			
Styrene	0.5			
Bromoform	0.5			
Isopropylbenzene	0.5			
1,1,2,2-Tetrachloroethane	0.5			
Bromobenzene	0.5			
1,2,3-Trichloropropane	0.5			
n-Propylbenzene	0.5			
2-Chlorotoluene	0.5			
1,3,5-Trimethylbenzene	0.5			
4-Chlorotoluene	0.5			
tert-Butylbenzene	0.5			
1,2,4-Trimethylbenzene	0.5		•	
sec-Butlybenzene	0.5			
1,3-Dichlorobenzene	0.5			
4-Isopropyltoluene	0.5			•
1,4-Dichlorobenzene	0.5			
n-Butlybenzene	0.5		•	
1,2-Dichlorobenzene	0.5	•		
1,2-Dibromo-3-chloropropane	0.5	R	R	R
1,2,4-Trichlorobenzene	0.5		•	
Hexachlorobutadiene	0.5			
Naphthalene	0.5			
1,2,3-Trichlorobenzene	0.5			

Remarks:

Field Duplicate



Appendix C Laboratory Reported Result

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-01

Sample wt/vol:

Lab File ID:

V5A3305

25.00 (g/mL) ML

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	ממממממם מממממממממממ
590-20-72,2-Dichloropropane 107-06-21,2-Dichloroethane 74-97-5Bromochloromethane 67-66-3Chloroform 56-23-5Carbon Tetrachloride 71-55-61,1-Trichloroethane 563-58-61,1-Dichloropropene 79-01-6Trichloroethene	0.50 0.50 0.50 12 0.50 0.50	ם ם ם ם
71-43-2Benzene 74-95-3Dibromomethane 75-27-4Bromodichloromethane 10061-01-5Toluene 10061-02-6trans-1,3-Dichloropropene 79-00-51,1,2-Trichloroethane	0.50 0.50	ם מ מ מ
127-18-4Tetrachloroethene 142-28-91,3-Dichloropropane 124-48-1Dibromochloromethane 106-93-41,2-Dibromoethane 108-90-7Chlorobenzene	0.50 0.50 0.50 0.50 0.50	ם ט ט ט

EPA SAMPLE NO.

TB02

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3305

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

Lab Sample ID: E0475-01

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	ττ
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	-
95-47-6O-Xylene	0.50	
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene	0.50	
	0.50	_
79-34-51,1,2,2-Tetrachloroethane	1 1	-
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	-
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	Ŭ
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	Ŭ
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U
96-12-81,2-Dibromo-3-chloropropane	0.50	JI-K
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	_
1,2,0 11101120101010		i
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FORM I VOA

EPA SAMPLE NO.

TW09

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-02

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3306

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

75-71-8	0.50 U 0.50 U
127-18-4Tetrachloroethene	.0.50 U

FORM I VOA

EPA SAMPLE NO.

TW09

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-02

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3306

Level: (low/med)

CAS NO.

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

OLM03.0

FORM I VOA

EPA SAMPLE NO.

TW10

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-03

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3307

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume:____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Q CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

75-71-8Dichlorodifluoromethane	0.50	ττ
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	_
75-35-41,1-Dichloroethene	0.50	
	0.50	1 1
75-09-2Methylene Chloride	0.50	1 - 1
156-60-5trans-1,2-Dichloroethene		-
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	1 1
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	4
71-55-61,1,1-Trichloroethane	0.50	
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	U
71-43-2Benzene	0.50	U
74-95-3Dibromomethane	0.50	U
75-27-4Bromodichloromethane	0.50	U
10061-01-5cis-1,3-Dichloropropene	0.50	U
108-88-3Toluene	0.50	שׁ
10061-02-6trans-1,3-Dichloropropene	0.50	U
79-00-51,1,2-Trichloroethane	0.50	U
127-18-4Tetrachloroethene	0.50	U
142-28-91,3-Dichloropropane	0.50	U
124-48-1Dibromochloromethane	0.50	U
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	_
	1	
	-	· ———

FORM I VOA

EPA SAMPLE NO.

TW10

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3307

Date Received: 04/07/98

Level: (low/med) LOW

Date Analyzed: 04/07/98

Lab Sample ID: E0475-03

% Moisture: not dec. GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane 0.50 100-41-4Ethylbenzene 0.50 136777-61-2m,p-Xylene 0.50 95-47-6Styrene 0.50 100-42-5	ט ט ט ט ט
100-41-4Ethylbenzene 0.50 136777-61-2m,p-Xylene 0.50 95-47-6	ט ט ט ט ט ט ט
136777-61-2m,p-Xylene 0.50 95-47-6	ט ט ט ט
95-47-6	ט ט ט
100-42-5Bromoform 0.50	ט (כ
75-25-2Bromoform 0.50	ט ט
	_
96-18-41,2,3-Trichloropropane0.50	
103-65-1n-Propylbenzene 0.50	
95-49-82-Chlorotoluene 0.50	
108-67-81,3,5-Trimethylbenzene0.50	
106-43-44-Chlorotoluene 0.50	_
98-06-6tert-Butylbenzene0.50	
95-63-61,2,4-Trimethylbenzene0.50	
135-98-8sec-Butylbenzene0.50) Ŭ
541-73-11,3-Dichlorobenzene 0.50) ∪
99-87-6	ט (
106-46-71,4-Dichlorobenzene 0.50) ט
104-51-8n-Butylbenzene 0.50) U
95-50-11,2-Dichlorobenzene 0.50	ט ע
96-12-81,2-Dibromo-3-chloropropane 0.50	015
120-82-11,2,4-Trichlorobenzene 0.50	
87-68-3Hexachlorobutadiene 0.50) บ
91-20-3Naphthalene 0.50	U
87-61-61,2,3-Trichlorobenzene 0.50	טוֹע
	_

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-04

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3308

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L (

ab no.	(dg/H of dg/kg	, 66, 1	×
75-71-8	Dichlorodifluoromethane	0.50	ij
	Chloromethane	0.50	
75-01-4	Vinyl Chloride	0.50	
74-83-9	Bromomethane	0.50	
	Chloroethane	0.50	
75-69-4	Trichlorofluoromethane	0.50	
75-35-4	1,1-Dichloroethene	0.50	
75-09-2	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	
75-34-3	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	
590-20-7	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
67-66-3	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	
71-43-2	Benzene	0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	0.50 t	
	cis-1,3-Dichloropropene	0.50 t	
108-88-3	Toluene	0.34	
10061-02-6	trans-1,3-Dichloropropene	0.50 0	
79-00-5	1,1,2-Trichloroethane	0.50 t	
127-18-4	Tetrachloroethene	0.50 t	J
	1,3-Dichloropropane	0.50 t	
124-48-1	Dibromochloromethane	0.50 t	
106-93-4	1,2-Dibromoethane	0.50 t	
108-90-7	Chlorobenzene	0.50 t	
		079	
		012	

FORM I VOA

EPA SAMPLE NO.

TW11

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

CAS NO. COMPOUND

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-04

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3308

Level: (low/med) LOW

% Moisture: not dec.

Date Received: 04/07/98

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6Styrene 100-42-5Styrene 75-25-2Bromoform 98-82-8	0.50 0.50
135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene 99-87-64-Isopropyltoluene 106-46-71,4-Dichlorobenzene 104-51-8n-Butylbenzene	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U

EPA SAMPLE NO.

TW12

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

CAS NO.

Lab Sample ID: E0475-05

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3309

Level: (low/med)

Date Received: 04/07/98

LOW

Date Analyzed: 04/07/98

% Moisture: not dec.

Dilution Factor: 1.0

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

74-87-3 75-01-4 75-01-4 75-00-3 75-69-4 75-35-4 75-09-2 156-60-5 1634-04-4 75-34-3 156-59-2 107-06-2 74-97-5 56-23-5 71-55-6 563-58-6 79-01-6 78-87-5	DichlorodifluoromethaneChloromethaneVinyl ChlorideBromomethaneChloroethaneTrichlorofluoromethaneI,1-DichloroetheneMethylene Chloridetrans-1,2-DichloroetheneMethyl tert-butyl ether1,1-Dichloroethanecis-1,2-Dichloroethene2,2-Dichloropropane1,2-DichloroethaneChloroformCarbon Tetrachloride1,1-Trichloroethane1,1-Dichloropropene1,2-Dichloropropene	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	ממם ממממממממממ – ב פממממממממ –
156-59-2 590-20-7 107-06-2 74-97-5 67-66-3 56-23-5 71-55-6 563-58-6 79-01-6	cis-1,2-Dichloroethene2,2-Dichloropropane1,2-DichloroethaneBromochloromethaneChloroformCarbon Tetrachloride1,1,1-Trichloroethane1,1-DichloropropeneTrichloroethene	0.50 0.50 0.50 0.50 0.50 0.50 1.3 0.50 0.50	ם ם ם ם ם ם ם ם
71-43-2 74-95-3 75-27-4 10061-01-5 108-88-3 10061-02-6 79-00-5 127-18-4 142-28-9 124-48-1 106-93-4	BenzeneDibromomethaneBromodichloromethanecis-1,3-Dichloropropene	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	מממממממממ

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3309

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

Lab Sample ID: E0475-05

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

EPA SAMPLE NO.

TW13

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-06

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3310

Level: (low/med) LOW

Soil Extract Volume: ____(uL)

Date Received: 04/07/98

% Moisture: not dec.

ID: 0.25 (mm)

Date Analyzed: 04/07/98

GC Column: DB-624

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

		 	
75-71-8	Dichlorodifluoromethane	0.50	U
	Chloromethane	0.50	_
	Vinyl Chloride	0.50	
74-83-9	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	_
	Methylene Chloride	0.50	_
156-60-5	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
75-34-3	·1,1-Dichloroethane	0.50	7
	cis-1,2-Dichloroethene	0.50	1
590-20-7	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	-
74-97-5	Bromochloromethane	0.50	1
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	1
	1,1,1-Trichloroethane	0.50	1 '
71-33-6	1,1-111chioroethane		1
70 01 6	The state of the s	0.50) ·
	Trichloroethene	0.50	4
71-43-2	1,2-Dichloropropane	0.50	
	Benzene	0.50	
		0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
	trans-1,3-Dichloropropene	0.50	
	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.36	
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	1
	1,2-Dibromoethane	0.50	_
108-90-7	Chlorobenzene	0.50	ט

EPA SAMPLE NO.

TW13

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-06

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3310

Level:

(low/med)

Date Received: 04/07/98

LOW

Date Analyzed: 04/07/98

% Moisture: not dec.

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

GC Column: DB-624

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	ט
100-41-4Ethylbenzene	0.50	U
136777-61-2m,p-Xylene	0.50	U
95-47-6o-Xylene	0.50	U
100-42-5Styrene	0.50	U
75-25-2Bromoform	0.50	U
98-82-8Isopropylbenzene	0.50	U
79-34-51,1,2,2-Tetrachloroethane	0.50	U
108-86-1Bromobenzene	0.50	Ū
96-18-41,2,3-Trichloropropane	0.50	-
103-65-1n-Propylbenzene	0.50	!
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	Ū
106-43-44-Chlorotoluene	0.50	ט
98-06-6tert-Butylbenzene	0.50	1
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	שׁ
104-51-8n-Butylbenzene	0.50	ַ
95-50-11,2-Dichlorobenzene	0.50	U
96-12-81,2-Dibromo-3-chloropropane	0.50	II S
120-82-11,2,4-Trichlorobenzene	0.50	U
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U
		l

EPA SAMPLE NO.

TW14

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER Lab Sample ID: E0475-07

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3311

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

75 71 0	-Dichlorodifluoromethane	0.50	TT
74-87-3		0.50	
		0.50	1
	-Vinyl Chloride		1
74-83-9		0.50 0.50	
75-00-3			
	-Trichlorofluoromethane	0.50	
	-1,1-Dichloroethene	0.50	
	-Methylene Chloride	0.50	
156-60-5	-trans-1,2-Dichloroethene	0.50	
1634-04-4	-Methyl tert-butyl ether	0.50	
	-1,1-Dichloroethane	0.50	
156-59-2	-cis-1,2-Dichloroethene	0.50	
590-20-7	-2,2-Dichloropropane	0.50	
	-1,2-Dichloroethane	0.50	
	-Bromochloromethane	0.50	
67-66-3		0.50	
	-Carbon Tetrachloride	0.50	
71-55-6	-1,1,1-Trichloroethane	0.50	U
	-1,1-Dichloropropene	0.50	U
	-Trichloroethene	0.50	U
78-87-5	-1,2-Dichloropropane	0.50	U
71-43-2	-Benzene	0.50	ט
74-95-3	-Dibromomethane	0.50	ט
75-27-4	-Bromodichloromethane	0.50	U
10061-01-5	-cis-1,3-Dichloropropene	0.50	U .
108-88-3	-Toluene	0.50	U
10061-02-6	-trans-1,3-Dichloropropene	0.50	U
79-00-5	-1,1,2-Trichloroethane	0.50	
	-Tetrachloroethene	. 0.50	ַּט
	-1,3-Dichloropropane	0.50	ט
	-Dibromochloromethane	0.50	U
	-1,2-Dibromoethane	0.50	
108-90-7		0.50	i .
l 		·	١

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FORM I VOA

EPA SAMPLE NO.

TW14

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3311

Level: (low/med)

LOW

Date Received: 04/07/98

Lab Sample ID: E0475-07

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50 U
100-41-4Ethylbenzene	0.50 U
136777-61-2m,p-Xylene	0.50 U
95-47-6	0.50 U
100-42-5Styrene	0.50 U
75-25-2Bromoform	0.50 U
98-82-8Isopropylbenzene	0.50 U
79-34-51,1,2,2-Tetrachloroethane	0.50 U
108-86-1Bromobenzene	0.50 U
	0.50 U
96-18-41,2,3-Trichloropropane	0.50 U
103-65-1n-Propylbenzene	
95-49-82-Chlorotoluene	0.50 U
108-67-81,3,5-Trimethylbenzene	0.50 U
106-43-44-Chlorotoluene	0.50 U
98-06-6tert-Butylbenzene	0.50 U
95-63-61,2,4-Trimethylbenzene	0.50 U
135-98-8sec-Butylbenzene	0.50 U
541-73-11,3-Dichlorobenzene	0.50 U
99-87-64-Isopropyltoluene	0.50 U
106-46-71,4-Dichlorobenzene	0.50 U
104-51-8n-Butylbenzene	0.50 U
95-50-11,2-Dichlorobenzene	م 0.50 ا
96-12-81,2-Dibromo-3-chloropropane	0.50
120-82-11,2,4-Trichlorobenzene	0.50 U
87-68-3Hexachlorobutadiene	0.50 U
91-20-3Naphthalene	0.50 U
87-61-61,2,3-Trichlorobenzene	0.50 U
	,

EPA SAMPLE NO.

TW15

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-08

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3324

Date Received: 04/07/98

Level: (low/med)

LOW

Date Analyzed: 04/07/98

% Moisture: not dec.

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

156-60-5trans-1,2-Dichloroethene 1634-04-4Methyl tert-butyl ether 75-34-31,1-Dichloroethane 156-59-2cis-1,2-Dichloroethene 590-20-72,2-Dichloropropane 107-06-21,2-Dichloroethane 74-97-5Bromochloromethane 67-66-3Chloroform 56-23-5Carbon Tetrachloride 71-55-61,1,1-Trichloroethane 563-58-61,1-Dichloropropene 79-01-6Trichloroethene 78-87-51,2-Dichloropropane 71-43-2Benzene 74-95-3Dibromomethane	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U
75-27-4Bromodichloromethane 10061-01-5cis-1,3-Dichloropropene 108-88-3Toluene 10061-02-6trans-1,3-Dichloropropene 79-00-51,1,2-Trichloroethane 127-18-4Tetrachloroethene 142-28-91,3-Dichloropropane 124-48-1Dibromochloromethane	0.52 0.50

FORM I VOA

EPA SAMPLE NO.

TW15

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

LOW

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-08

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3324

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	U
100-41-4Ethylbenzene	0.50	U
136777-61-2m,p-Xylene	0.50	U
95-47-6o-Xylene	0.50	U
100-42-5Styrene	0.50	U
75-25-2Bromoform	0.50	Ū
98-82-8Isopropylbenzene	0.50	U
79-34-51,1,2,2-Tetrachloroethane	0.50	-
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	_
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	
95-63-61,2,4-Trimethylbenzene	0.50	•
135-98-8sec-Butylbenzene	0.50	_
	0.50	-
541-73-11,3-Dichlorobenzene	0.50	
99-87-64-Isopropyltoluene	0.50	
106-46-71,4-Dichlorobenzene	0.50	
104-51-8n-Butylbenzene		_
95-50-11,2-Dichlorobenzene	0.50	
96-12-81,2-Dibromo-3-chloropropane_	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	_
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	U

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EPA SAMPLE NO.

TW16

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-09

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3327

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

LOW

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50 U
74-87-3Chloromethane	0.50 0
75-01-4Vinyl Chloride	0.50 U
74-83-9Bromomethane	_ 0.50 บ
75-00-3Chloroethane	0.50 0
75-69-4Trichlorofluoromethane	0.50 0
75-35-41,1-Dichloroethene	0.81
75-09-2Methylene Chloride	0.50 0
156-60-5trans-1,2-Dichloroethene	- 0.50 U
1634-04-4Methyl tert-butyl ether	- 0.50 U
75-34-31,1-Dichloroethane	- 2.1
156-59-2cis-1,2-Dichloroethene	0.78
590-20-72,2-Dichloropropane	- 0.70 0
107-06-21,2-Dichloroethane	- 0.50 U
74-97-5Bromochloromethane	- 0.50 U
67-66-3Chloroform	0.50.33 JUV
56-23-5Carbon Tetrachloride	- 0.50 U
	_
71-55-61,1,1-Trichloroethane	$\frac{4.3}{0.50} \frac{7}{U}$
563-58-61,1-Dichloropropene	-1
79-01-6Trichloroethene	1.7
78-87-51,2-Dichloropropane	0.50 0
71-43-2Benzene	0.50 U
74-95-3Dibromomethane	0.50 U
75-27-4Bromodichloromethane	0.50 U
10061-01-5cis-1,3-Dichloropropene	0.50 U
108-88-3Toluene	0.50 U
10061-02-6trans-1,3-Dichloropropene	0.50 U
79-00-51,1,2-Trichloroethane	0.50 U
127-18-4Tetrachloroethene	5.6
142-28-91,3-Dichloropropane	0.50 U
124-48-1Dibromochloromethane	0.50 U
106-93-41,2-Dibromoethane	0.50 บ
108-90-7Chlorobenzene	0.50 U

FORM I VOA

EPA SAMPLE NO.

TW16

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-09

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3327

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
	0.50	_
95-47-6o-Xylene	0.50	_
100-42-5Styrene		-
75-25-2Bromoform	0.50	_
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	-
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	Ū
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	Ū
99-87-64-Isopropyltoluene	0.50	Ü
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	i -
95-50-11,2-Dichlorobenzene	0.50	1
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	זז
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	
67-61-61,2,3-111CiliOtobelizelle	0.30	اٽ

EPA SAMPLE NO.

TW17

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-10

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3328

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

	3.	<i>3,</i> 3, , ,	~
74-87-3 75-01-4 74-83-9 75-00-3 75-69-4 75-35-4 75-09-2 156-60-5 1634-04-4 75-34-3 156-59-2 590-20-7 107-06-2 74-97-5 67-66-3 563-58-6 79-01-6 78-87-5 71-43-2 74-95-3 74-95-3 10061-01-5- 108-88-3 10061-01-5- 108-88-3 10061-02-6- 79-00-5 127-18-4 142-28-9 124-48-1 106-93-4	DichlorodifluoromethaneChloromethaneVinyl ChlorideBromomethaneChloroethaneChloroethaneTrichlorofluoromethaneNethylene ChlorideMethyl tert-butyl etherMethyl tert-butyl etherNethyl tert-butyl ether1,1-Dichloroethane2,2-Dichloroethane2,2-Dichloropropane1,2-DichloromethaneCarbon Tetrachloride1,1,1-Trichloroethane1,1-DichloropropeneTrichloroethene1,2-DichloropropaneBenzeneDibromomethaneBromodichloromethane	0.5	0.50 UU UU UU UU UU UU UU UU UU UU UU UU UU

FORM I VOA

EPA SAMPLE NO.

TW17

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-10

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3328

Level: (low/med) LOW

Soil Extract Volume: (uL)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

		r	
100-41-4	n,p-Xylene D-Xylene Styrene Styrene Styrene Stopropylbenzene 1,1,2,2-Tetrachloroethane Stomobenzene 1,2,3-Trichloropropane 1,-Propylbenzene 2-Chlorotoluene 1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene 1,2,4-Trimethylbenzene 1,2,4-Trimethylbenzene 1,2,4-Trimethylbenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	ממממממממממממממממ
108-67-81 106-43-4	.,3,5-Trimethylbenzene -Chlorotoluene -crt-Butylbenzene .,2,4-Trimethylbenzene sec-Butylbenzene .,3-Dichlorobenzene -Isopropyltoluene .,4-Dichlorobenzene	0.50 0.50 0.50 0.50 0.50 0.50 0.50	משממממממממ
91-20-3		0.50	1 -

EPA SAMPLE NO.

TW18

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-11

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3329

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

CAS NO.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

75-71-8	
75-01-4Vinyl Chloride 0.50 U 74-83-9Bromomethane 0.50 U 75-00-3Chloroethane 0.50 U 75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5Methyl tert-butyl ether 0.50 U 75-34-3	
74-83-9	
75-00-3Chloroethane 0.50 U 75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 1.6 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-5Benzene 0.50 U 74-95-3Bromodichloromethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 1.6 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 1.7 563-58-61,2-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 1.6 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloroethane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-5Benzene 0.50 U 74-95-3Bibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 1.6 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 1.6 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 1.6 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 U 74-95-3Bromodichloromethane 0.50 U	
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 1.6 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
75-34-31,1-Dichloroethane 1.6 156-59-2cis-1,2-Dichloroethene 0.50 590-20-72,2-Dichloropropane 0.50 107-06-21,2-Dichloroethane 0.50 74-97-5Bromochloromethane 0.50 67-66-3Chloroform 0.50 56-23-5Carbon Tetrachloride 0.50 71-55-61,1,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 79-01-6Trichloroethene 0.50 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 75-27-4Bromodichloromethane 0.50	
156-59-2cis-1,2-Dichloroethene 0.50	
590-20-72, 2-Dichloropropane 0.50 U 107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61, 1, 1-Trichloroethane 1.7 563-58-61, 1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51, 2-Dichloropropane 0.81 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
74-97-5	
67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
56-23-5	
71-55-61,1,1-Trichloroethane 1.7 563-58-61,1-Dichloropropene 0.50 79-01-6Trichloroethene 0.50 78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 75-27-4Bromodichloromethane 0.50	
563-58-61,1-Dichloropropene 0.50	τ
79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.81 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	<u> -</u>
78-87-51,2-Dichloropropane 0.81 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 75-27-4Bromodichloromethane 0.50	
71-43-2Benzene 0.50 U 74-95-3Bromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U	
74-95-3	
75-27-4Bromodichloromethane 0.50 U	
10001 01 5 CID 1/5 Dichitotopiopene (0.50/0	
108-88-3Toluene 0.50 U	
10061-02-6trans-1,3-Dichloropropene 0.50 U	
79-00-51,1,2-Trichloroethane 0.50 U	
127-18-4Tetrachloroethene 0.50 U	
142-28-91,3-Dichloropropane 0.50 U	
124-48-1Dibromochloromethane 0.50 U	
106-93-41,2-Dibromoethane 0.50 U	
108-90-7Chlorobenzene 0.50 U	
0.50	

FORM I VOA

EPA SAMPLE NO.

TW18

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-11

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3329

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	ט
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	-
95-47-6	0.50	-
100-42-5Styrene	0.50	Ū
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethane	0.50	Ū
108-86-1Bromobenzene	0.50	Ū
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	Ū
95-49-82-Chlorotoluene	0.50	Ū
108-67-81,3,5-Trimethylbenzene	0.50	ľŪ
106-43-44-Chlorotoluene	0.50	Ū
98-06-6tert-Butylbenzene	0.50	שו
95-63-61,2,4-Trimethylbenzene	0.50	ט
135-98-8sec-Butylbenzene	0.50	Ū
541-73-11,3-Dichlorobenzene	0.50	Ū
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	ע ס
96-12-81,2-Dibromo-3-chloropropane	0.50	00
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U
		l

EPA SAMPLE NO.

TW19

Lab Name: MITKEM CORP.

Contract:

Case No.: SAS No.: Lab Code: MITKEM

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-12

25.00 (g/mL) ML

Lab File ID: V5A3330

Level: (low/med) LOW

Sample wt/vol:

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

Q

/5-/1-8D1/	chlorodifluoromethane	0.50	ט
74-87-3Ch		0.50	ľ
75-01-4Vii		0.50	1
74-83-9Bro		0.50	שׁ
75-00-3Ch		0.50	U
	ichlorofluoromethane	0.50	U -
75-35-41,	1-Dichloroethene	0.50	U
75-09-2 M e	thylene Chloride	0.50	U
	ans-1,2-Dichloroethene	0.50	U
1634-04-4Me	thyl tert-butyl ether	0.43	(J)
75-34-31,	1-Dichloroethane	0.50	ט
156-59-2ci	s-1,2-Dichloroethene	0.50	U
590-20-72,		0.50	U
107-06-21,	2-Dichloroethane	0.50	U
74-97-5Bre	omochloromethane	0.50	U
67-66-3Ch	loroform	0.50	U
56-23-5Ca:	rbon Tetrachloride	0.50	U
71-55-61,	1,1-Trichloroethane	0.50	U
563-58-61,	1-Dichloropropene	0.50	U
79-01-6Tr		0.50	
78-87-51,		0.50	1
71-43-2Be:		0.50	
74-95-3Di		0.50	U
75-27-4Br		0.50	1
	s-1,3-Dichloropropene	0.50	1
108-88-3To		0.50	1
	ans-1,3-Dichloropropene	0.50	1 -
	1,2-Trichloroethane	0.50	
127-18-4Te		0.50	
142-28-91,		0.50	
124-48-1Di		0.50	1
106-93-41,		0.50	1
108-90-7Ch	lorobenzene	0.50	U

FORM I VOA

EPA SAMPLE NO.

TW19	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-12

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3330

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

CAS NO.

COMPOUND

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

· · · · · · · · · · · · · · · · · · ·	 	·
630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	-
136777-61-2m,p-Xylene	0.50	-
95-47-6	0.50	Ì
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	
	0.50	-
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethane		-
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	-
98-06-6tert-Butylbenzene	0.50	_
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	ט פ
96-12-81,2-Dibromo-3-chloropropane	0.50	AND AR
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	שו
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	

EPA SAMPLE NO.

TW20

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-13

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3331

LOW

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

	The state of the s		
	Dichlorodifluoromethane	0.50	
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	Ū
	Bromomethane	0.50	U-
75-00-3	Chloroethane	0.50	Ū
75-69-4	Trichlorofluoromethane	0.50	Ū
	1,1-Dichloroethene	0.50	U
	Methylene Chloride	0.50	
	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	
	Bromochloromethane	0.50	
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	
	1,1-Dichloropropene	0.50	_
	Trichloroethene	0.50	
	1,2-Dichloropropane	0.50	
71-43-2		0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.34	
	trans-1,3-Dichloropropene	0.50	
	1,1,2-Trichloroethane	0.50	I -
	Tetrachloroethene	0.50	1
	1,3-Dichloropropane	0.50	I -
	Dibromochloromethane	0.50	-
	1,2-Dibromoethane	0.50	
TO8-AO-1	Chlorobenzene	0.50	l٥

FORM I VOA

EPA SAMPLE NO.

TW20

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-13

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V5A3331

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

COMPOUND (ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	ŤТ
	0.50	
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene		
95-47-6o-Xylene	0.50	
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	-
96-18-41,2,3-Trichloropropane	0.50	Ŭ
103-65-1n-Propylbenzene	0.50	U
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	
106-46-71,4-Dichlorobenzene	0.50	
104-51-8n-Butylbenzene	0.50	
95-50-11,2-Dichlorobenzene	0.50	î .
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	-
87-68-3Hexachlorobutadiene	0.50	_
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	_
6/-61-61,2,3-111CH1010DefizeHe	, 0.50	١
	l	l

EPA SAMPLE NO.

TW21

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-14

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3332

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

CAS NO.

GC Column: DB-624 ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

. Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

	Dichlorodifluoromethane	0.50	J
74-87-3	Chloromethane	0.50 0	J
75-01-4	Vinyl Chloride	0.50 lt	J
	Bromomethane	0.50 t	IJ
	Chloroethane		J
75-69-4	Trichlorofluoromethane	0.50	J
	1,1-Dichloroethene	0.50	
75-09-2	Methylene Chloride		Ü
	trans-1,2-Dichloroethene	1	Ü
	Methyl tert-butyl ether	1	Ü
	1,1-Dichloroethane	1	Ü
	cis-1,2-Dichloroethene	1 1 '	Ü
	2,2-Dichloropropane		IJ
	1,2-Dichloroethane		IJ
	Bromochloromethane	1	IJ
	Bromochioromethane		_
		1	Ŭ.
	Carbon Tetrachloride		IJ
71-55-6	1,1,1-Trichloroethane	1	Ŭ.
	1,1-Dichloropropene		Ü
	Trichloroethene	1	Ū
	1,2-Dichloropropane	1	Ü
71-43-2		1	IJ
	Dibromomethane	1	J
	Bromodichloromethane		J
10061-01-5	cis-1,3-Dichloropropene	0.50 t	IJ
108-88-3		0.50 t	J
10061-02-6	trans-1,3-Dichloropropene	-	IJ
	1,1,2-Trichloroethane	0.50 0	Ū
	Tetrachloroethene	0.50	U
142-28-9	1,3-Dichloropropane	0.50	U
	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.50	Ū
	Chlorobenzene	0.50	Ū
		·	

FORM I VOA

OLMO3.0

TW21

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-14

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3332

LOW

Date Received: 04/07/98

% Moisture: not dec.

Level: (low/med)

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

EPA SAMPLE NO.

TW155

Lab Name: MITKEM CORP. Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER Lab Sample ID: E0475-15

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3333

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

CAD NO.	COMPOSID (ug/11 of ug	g, Ng, 00, <u>2</u>	×
75-71-8	Dichlorodifluoromethane	0.50	U
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
74-83-9	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	1
75-35-4	1,1-Dichloroethene	0.50	
75-09-2	Methylene Chloride	0.50	
	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	
75-34-3	1,1-Dichloroethane	0.32	
	cis-1,2-Dichloroethene	0.50	
590-20-7	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
67-66-3	Chloroform	0.50	
	Carbon Tetrachloride	0.50	U
71-55-6	1,1,1-Trichloroethane	0.87	
563-58-6	1,1-Dichloropropene	0.50	Ū
79-01-6	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	U
71-43-2	Benzene	0.50	U
74-95-3	Dibromomethane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
10061-02-6	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.50	
142-28-9	1,3-Dichloropropane	0.50	
	Dibromochloromethane	0.50	
	1,2-Dibromoethane	0.50	U
	Chlorobenzene	0.50	U
		113-	•
		<u> </u>	

FORM I VOA

EPA SAMPLE NO.

TW155

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-15

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3333

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

	630-20-61,1,1,2-Tetrachloroethane	0.50	U
	100-41-4Ethylbenzene	0.50	
	136777-61-2m,p-Xylene	0.50	
	95-47-6	0.50	_
	100-42-5Styrene	0.50	
	75-25-2Bromoform	0.50	-
	98-82-8Isopropylbenzene	0.50	
	79-34-51,1,2,2-Tetrachloroethane	0.50	-
	108-86-1Bromobenzene	0.50	
		0.50	
	96-18-41,2,3-Trichloropropane		_
	103-65-1n-Propylbenzene	0.50	_
	95-49-82-Chlorotoluene	0.50	_
	108-67-81,3,5-Trimethylbenzene	0.50	-
	106-43-44-Chlorotoluene	0.50	-
	98-06-6tert-Butylbenzene	0.50	_
	95-63-61,2,4-Trimethylbenzene	0.50	
	135-98-8sec-Butylbenzene	0.50	_
	541-73-11,3-Dichlorobenzene	0.50	
	99-87-64-Isopropyltoluene	0.50	U
	106-46-71,4-Dichlorobenzene	0.50	U .
	104-51-8n-Butylbenzene	0.50	U
	95-50-11,2-Dichlorobenzene	0.50	U
	96-12-81,2-Dibromo-3-chloropropane	0.50	めり
	120-82-11,2,4-Trichlorobenzene	0.50	U
	87-68-3Hexachlorobutadiene	0.50	U
	91-20-3Naphthalene	0.50	U
	87-61-61,2,3-Trichlorobenzene	0.50	U
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J		l	

FORM I VOA

EPA SAMPLE NO.

TW156

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-16

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3334

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8			,,,	
75-01-4			0.50	U
75-01-4	74-87-3	Chloromethane	0.50	U
74-83-9	75-01-4	Vinvl Chloride		
75-00-3	74-83-9	Bromomethane		
75-69-4	75-00-3	Chloroethane		
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.66 156-59-2cis-1,2-Dichloroethene 2.6 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 79-01-6Trichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U			0.50	Ū
75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.66 156-59-2cis-1,2-Dichloroethene 2.6 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Bromochloromethane 0.50 U 67-66-3Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 76-23-51,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 79-01-6Trichloroethene 0.50 U 70-27-4Benzene 0.50 U 70-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U			_ •	-
156-60-5	75-09-2	Methylene Chloride	_ I	
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.66 156-59-2cis-1,2-Dichloroethene 2.6 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.99 J 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			0.50	שו
75-34-31,1-Dichloroethane 0.66 156-59-2cis-1,2-Dichloroethene 2.6 590-20-72,2-Dichloropropane 0.50 107-06-21,2-Dichloroethane 0.50 74-97-5Bromochloromethane 0.50 67-66-3Chloroform 0.50 56-23-5Carbon Tetrachloride 0.50 71-55-61,1,1-Trichloroethane 0.99 563-58-61,1-Dichloropropene 0.50 79-01-6Trichloroethene 0.58 78-87-51,2-Dichloropropane 0.50 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 10061-01-5cis-1,3-Dichloropropene 0.50 10061-02-6trans-1,3-Dichloropropene 0.50 127-18-4Tetrachloroethane 0.50 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 124-48-1Dibromochloromethane 0.50 106-93-41,2-Dibromoethane 0.50				
156-59-2cis-1, 2-Dichloroethene 2.6 590-20-72, 2-Dichloropropane 0.50 107-06-21, 2-Dichloroethane 0.50 74-97-5Bromochloromethane 0.50 67-66-3Chloroform 0.50 56-23-5Carbon Tetrachloride 0.50 71-55-61, 1, 1-Trichloroethane 0.99 563-58-61, 1-Dichloropropene 0.50 79-01-6Trichloroethene 0.58 78-87-51, 2-Dichloropropane 0.50 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 10061-01-5cis-1, 3-Dichloropropene 0.50 10061-02-6trans-1, 3-Dichloropropene 0.50 10061-02-6trans-1, 3-Dichloropropene 0.50 127-18-4Tetrachloroethene 1.6 142-28-91, 3-Dichloropropane 0.50 124-48-1Dibromochloromethane 0.50 106-93-41, 2-Dibromoethane 0.50			_ 1	
590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.99 J 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.58 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	156-59-2	cis-1,2-Dichloroethene		
107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.99 J 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	590-20-7	2,2-Dichloropropane		
74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.99 J 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			N	I .
67-66-3				
56-23-5			_ 1	
71-55-61,1,1-Trichloroethane 0.99 J 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.58 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
563-58-61,1-Dichloropropene 0.50 79-01-6Trichloroethene 0.58 78-87-51,2-Dichloropropane 0.50 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 75-27-4Bromodichloromethane 0.50 10061-01-5cis-1,3-Dichloropropene 0.50 108-88-3Toluene 0.50 10061-02-6trans-1,3-Dichloropropene 0.50 79-00-51,1,2-Trichloroethane 0.50 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 124-48-1Dibromochloromethane 0.50 106-93-41,2-Dibromoethane 0.50			0.99	J
79-01-6Trichloroethene 0.58 78-87-51,2-Dichloropropane 0.50 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 75-27-4Bromodichloromethane 0.50 10061-01-5cis-1,3-Dichloropropene 0.50 108-88-3Toluene 0.50 10061-02-6trans-1,3-Dichloropropene 0.50 79-00-51,1,2-Trichloroethane 0.50 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 124-48-1Dibromochloromethane 0.50 106-93-41,2-Dibromoethane 0.50	563-58-6	1,1-Dichloropropene	0.50	Ū
78-87-51, 2-Dichloropropane 0.50 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 75-27-4Bromodichloromethane 0.50 10061-01-5cis-1, 3-Dichloropropene 0.50 108-88-3Toluene 0.50 10061-02-6trans-1, 3-Dichloropropene 0.50 79-00-51, 1, 2-Trichloroethane 0.50 127-18-4Tetrachloroethene 1.6 142-28-91, 3-Dichloropropane 0.50 124-48-1Dibromochloromethane 0.50 106-93-41, 2-Dibromoethane 0.50	79-01-6	Trichloroethene	0.58	
71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	78-87-5	1,2-Dichloropropane	- I	
74-95-3	71-43-2	Benzene	0.50	บ
10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	74-95-3	Dibromomethane		
108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	75-27-4	Bromodichloromethane	0.50	U
10061-02-6trans-1,3-Dichloropropene 0.50 <td< td=""><td>10061-01-5</td><td>cis-1,3-Dichloropropene</td><td>0.50</td><td>U.</td></td<>	10061-01-5	cis-1,3-Dichloropropene	0.50	U .
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			0.50	ע ו
127-18-4Tetrachloroethene 1.6 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	10061-02-6	trans-1,3-Dichloropropene	0.50	U
142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			0.50	U
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			1.6	
106-93-41,2-Dibromoethane 0.50 U	142-28-9	1,3-Dichloropropane	0.50	Ū
106-93-41,2-Dibromoethane 0.50 U	124-48-1	Dibromochloromethane	0.50	U
108-90-7Chlorobenzene0.50 U	106-93-4	1,2-Dibromoethane	0.50	บ
	108-90-7	Chlorobenzene	0.50	[ט
			-	

FORM I VOA

EPA SAMPLE NO.

TW156

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-16

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3334

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

	·
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 U U U U U U U U U U U U U U U U U U U
98-06-6tert-Butylbenzene 95-63-61,2,4-Trimethylbenzene 135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene 99-87-64-Isopropyltoluene	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U

EPA SAMPLE NO.

TW157

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-17

- - -

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3335

Level: (low/med)

l) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume:____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	U
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride		Ŭ
74-83-9Bromomethane	0.50	Ū
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	-
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	_
67-66-3Chloroform	0.50	-
	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane		
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	_
71-43-2Benzene	0.50	-
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	-
142-28-91,3-Dichloropropane	0.50	-
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	U
108-90-7Chlorobenzene	0.50	U

133

EPA SAMPLE NO.

TW157

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

LOW

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-17

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3335

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

EPA SAMPLE NO.

TW158

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-18

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3336

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

LOW

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	ט
75-01-4	Vinyl Chloride	0.50	ט
74-83-9	Bromomethane	0.50	U
	Chloroethane	0.50	Ū
	Trichlorofluoromethane	0.50	Ū
	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	
	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	-
	2,2-Dichloropropane	0.50	_
107-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	
563-50-6	1,1-Dichloropropene	0.50	
	Trichloroethene	0.50	
	1,2-Dichloropropane	0.50	
71-43-2		0.50	_
	Dibromomethane	0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene		-
10061-01-5		0.50 0.50	_
			-
10061-02-6	trans-1,3-Dichloropropene	0.50	1
19-00-5	1,1,2-Trichloroethane	0.50	-
	Tetrachloroethene	0.50	L
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	_
106-93-4	1,2-Dibromoethane		<u>U</u> .
108-90-7	Chlorobenzene	0.50	U

EPA SAMPLE NO.

TW158

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

LOW

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-18

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3336

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

140

EPA SAMPLE NO.

TW159

Lab Name: MITKEM CORP. Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER Lab Sample ID: E0475-19

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3337

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:
CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

75-71-8Dichlorodifluoromethane	CAS NO.	COMPOUND (ug	3/TI OI	ug/ Ng/	00/1	Q
74-87-3	75-71-8	Dichlorodifluoromet	nane		0.50	IJ
75-01-4						
74-83-9	75-01-4	Vinvl Chloride				
75-00-3	74-83-9	Bromomethane				
75-69-4Trichlorofluoromethane 0.50 U 75-35-4	75-00-3	Chloroethane				
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 79-01-6Trichloropropene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 74-95-3Benzene 0.50 U 74-95-3			ane	-		
75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Bromochloromethane 0.50 U 67-66-3Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-5Dibromomethane 0.50 U 75-27-4Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromomchloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U	75-35-4	1.1-Dichloroethene				
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloropethene 0.50 U 590-20-72,2-Dichloropethane 0.50 U 107-06-21,2-Dichloropethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloropethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 1061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U	75-09-2	Methylene Chloride				
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloropthene 0.50 U 590-20-72,2-Dichloroptopane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U	156-60-5	trans-1,2-Dichloroe	hene			1
75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U	1634-04-4	Methvl tert-butvl e	her			
156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U	75-34-3	1,1-Dichloroethane		-		
590-20-72, 2-Dichloropropane 0.50 U 107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61, 1, 1-Trichloroethane 0.50 U 563-58-61, 1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51, 2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 10061-02-6Toluene 0.50 U 10061-02-61, 1, 2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91, 3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41, 2-Dibromoethane 0.50 U	156-59-2	cis-1,2-Dichloroet $\overline{\mathrm{he}}$	ene	_	0.50	lΰ
107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	590-20-7	2,2-Dichloropropane		<u> </u>		
67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	107-06-2	1,2-Dichloroethane				
67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	74-97-5	Bromochloromethane	 -		0.50	U
71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	67-66-3	Chloroform			0.50	U
563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U					0.50	U
79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	71-55-6	1,1,1-Trichloroetha	ne	·	0.50	U
79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	563-58-6	1,1-Dichloropropene			0.50	U
71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	79-01-6	Trichloroethene			0.50	U
71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	78-87-5	1,2-Dichloropropane			0.50	U
75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	71-43-2	Benzene			0.50	U
10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U					0.50	U
108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U						
10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	10061-01-5	cis-1,3-Dichloroprop	pene			
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U						
127-18-4Tetrachloroethene 0.31 J 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	10061-02-6	trans-1,3-Dichlorop	ropene_			
142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			1e			
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				1		1
106-93-41,2-Dibromoethane 0.50 U						
·			≥			
108-90-7Chlorobenzene 0.50 U						
	108-90-7	Chlorobenzene			0.50	שן
				l		. I

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EPA SAMPLE NO.

TW159

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3337

Level: (low/med)

Date Received: 04/07/98

Lab Sample ID: E0475-19

% Moisture: not dec.

LOW

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

EPA SAMPLE NO.

TW160

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-20

Sample wt/vol:

Lab File ID:

V5A3338

LOW

25.00 (g/mL) ML

Date Received: 04/07/98

Level: (low/med)

Date Analyzed: 04/08/98

% Moisture: not dec.

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

	3, 3,		_
75-71-8	Dichlorodifluoromethane	3.2	
	Chloromethane	0.50	TT
	Vinyl Chloride	0.50	
	Bromomethane	0.50	1
	Chloroethane	0.50	
	Trichlorofluoromethane	0.57	
	1,1-Dichloroethene	0.40	
	Methylene Chloride	0.50	
	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	1
75-34-3	1,1-Dichloroethane	1.3	
	cis-1,2-Dichloroethene	2.7	l
590-20-7	2,2-Dichloropropane	0.50	
	1,2-Dichloroethane	0.50	1 -
	Bromochloromethane	0.50	_
67-66-3		0.50	
	Carbon Tetrachloride	0.50	1
	1,1,1-Trichloroethane	1.5	٦ ا
71-55-6	1,1-Dichloropropene	0.50	
70-01-6	Trichloroethene	0.50	0
79-01-6	1,2-Dichloropropane	0.73	TT
71-43-2		1	1 -
	Benzene Dibromomethane	0.50 0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	8.3	١٥
	1,3-Dichloropropane	0.50	
	Dibromochloromethane	0.50	
	1,2-Dibromoethane	0.50	
100-33-4	Chlorobenzene		1 -
100-30-/	curoropeuseue	0.50	U
			l

FORM I VOA

EPA SAMPLE NO.

TW160

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-20

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3338

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

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630-20-6	1,1,1,2-Tetrachloroethane	0.50	U
	Ethylbenzene	0.50	บ
136777-61-2		0.50	บ
95-47-6		0.50	U
100-42-5		0.50	שׁ
75-25-2		0.50	U
98-82-8	Isopropylbenzene	0.50	U
	1,1,2,2-Tetrachloroethane	0.50	U
108-86-1		0.50	ט
96-18-4	1,2,3-Trichloropropane	0.50	U
	n-Propylbenzene	0.50	U
	2-Chlorotoluene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
106-43-4	4-Chlorotoluene	0.50	U
98-06-6	tert-Butylbenzene	0.50	U
95-63-6	1,2,4-Trimethylbenzene	0.50	שׁ
135-98-8	sec-Butylbenzene	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
99-87-6	4-Isopropyltoluene	0.50	U
	1,4-Dichlorobenzene	0.50	U
	n-Butylbenzene	0.50	1 -
	1,2-Dichlorobenzene	0.50	
96-12-8	1,2-Dibromo-3-chloropropane_	0.50	
	1,2,4-Trichlorobenzene	0.50	
	Hexachlorobutadiene	0.50	_
91-20-3		0.50	_
87-61-6	1,2,3-Trichlorobenzene	0.50	Ū

FORM I VOA

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EPA SAMPLE NO.

TW161

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-21

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3339

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

			-
75-71-8	Dichlorodifluoromethane	0.50	U
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	
75-34-3	1,1-Dichloroethane	0.50	
156-59-2	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	
	1,2-Dichloroethane	0.50	
	Bromochloromethane	0.50	
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	
	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	
71-43-2	Benzene	0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
10061-02-6	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	
142-28-9	1,3-Dichloropropane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.50	U
108-90-7	Chlorobenzene	0.50	U

EPA SAMPLE NO.

SDG No.: E0475

TW161

Lab Name: MITKEM CORP.

Contract:

SAS No.:

Lab Code: MITKEM Case No.:

Matrix: (soil/water) WATER Lab Sample ID: E0475-21

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3339

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. ____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

630-20-61,1,1,2-Tetrachloroethane	0.50	IJ
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	-
95-47-6o-Xylene	0.50	
100-42-5Styrene	0.50	-
75-25-2Bromoform	0.50	-
98-82-8Isopropylbenzene	0.50	_
	0.50	_
79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene	0.50	_
	0.50	· -
96-18-41,2,3-Trichloropropane		_
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	-
106-43-44-Chlorotoluene	0.50	_
98-06-6tert-Butylbenzene	0.50	_
95-63-61,2,4-Trimethylbenzene	0.50	•
135-98-8sec-Butylbenzene	0.50	1 -
541-73-11,3-Dichlorobenzene	0.50	_
99-87-64-Isopropyltoluene	0.50	-
106-46-71,4-Dichlorobenzene	0.50	_
104-51-8n-Butylbenzene	0.50	Ŭ
95-50-11,2-Dichlorobenzene	0.50	
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	Ŭ
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	ן ט
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EPA SAMPLE NO.

TW162

Lab Name: MITKEM CORP.

CAS NO.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-22

Sample wt/vol:

Lab File ID:

V5A3340

25.00 (g/mL) ML

Date Received: 04/07/98

Level: (low/med) LOW

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	3.		
75-71-8	Dichlorodifluoromethane	0.50	TT
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
156 60 5	trans-1,2-Dichloroethene	0.50	
150-60-5	Mother text but of other	0.50	
1634-04-4	Methyl tert-butyl ether		
	1,1-Dichloroethane	0.37	
	cis-1,2-Dichloroethene	0.50	
590-20-7	2,2-Dichloropropane	0.50	_
107-06-2	1,2-Dichloroethane	0.50	
	Bromochloromethane	0.50	
	Chloroform_	0.50	
	Carbon Tetrachloride	0.50	ע_
71-55-6	1,1,1-Trichloroethane	1.1	
563-58-6	1,1-Dichloropropene	0.50	
	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	[ט
71-43-2		0.50	U
	Dibromomethane	0.50	U
	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3		0.50	U
	trans-1,3-Dichloropropene	0.50	שׁ
79-00-5	1,1,2-Trichloroethane	0.50	ש
	Tetrachloroethene	0.50	U
142-28-9	1,3-Dichloropropane	0.50	שׁוֹ
124-48-1	Dibromochloromethane	0.50	lυ
	1,2-Dibromoethane	0.50	
	Chlorobenzene	0.50	ט
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FORM I VOA

EPA SAMPLE NO.

TW162

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-22

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3340

Level: (low/med) LOW

CAS NO. COMPOUND

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

EPA SAMPLE NO.

TW163

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-23

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3341

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

FORM I VOA

EPA SAMPLE NO.

TW163

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

25.00 (g/mL) ML

V5A3341

Sample wt/vol:

Lab File ID:

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

Lab Sample ID: E0475-23

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene	0.50 U 0.50 U
136777-61-2m,p-Xylene	0.50 U
95-47-6o-Xylene	0.50 U
100-42-5Styrene	0.50 U
75-25-2Bromoform	0.50 U
98-82-8Isopropylbenzene	0.50 U
79-34-51,1,2,2-Tetrachloroethane	0.50 U
108-86-1Bromobenzene	0.50 U
96-18-41,2,3-Trichloropropane	0.50 U
103-65-1n-Propylbenzene	0.50 U
95-49-82-Chlorotoluene	0.50 U
108-67-81,3,5-Trimethylbenzene	0.50 U
106-43-44-Chlorotoluene	0.50 U
98-06-6tert-Butylbenzene	0.50 U
95-63-61,2,4-Trimethylbenzene	0.50 U
135-98-8sec-Butylbenzene	0.50 Ŭ
541-73-11,3-Dichlorobenzene	0.50 U
99-87-64-Isopropyltoluene	0.50 U
106-46-71,4-Dichlorobenzene	0.50 U
104-51-8n-Butylbenzene	0.50 U
95-50-11,2-Dichlorobenzene	0.50 U
96-12-81,2-Dibromo-3-chloropropane	0.50
120-82-11,2,4-Trichlorobenzene	0.50 U
87-68-3Hexachlorobutadiene	0.50 U
91-20-3Naphthalene	0.50 U
87-61-61,2,3-Trichlorobenzene	0.50 U

EPA SAMPLE NO.

TW164

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-24

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3342

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

CAS NO.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume:____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L COMPOUND

75-71-8		3,		
74-87-3	75-71-8	Dichlorodifluoromethane	0.50	U
75-01-4			1	
74-83-9				
75-00-3	74-83-9	Bromomethane		
75-69-4				
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5				
75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U				
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromoethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U				
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Bromochloromethane 0.50 U 56-23-5Chloroform 0.50 U 71-55-61,1-Trichloroethane 0.50 U 73-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U 127-18-4				
75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 79-01-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 107-18-4Tetrachloroethane 0.50 U 127-18-4Dibromochloromethane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 763-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 122-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U	75-34-3	1.1-Dichloroethane		
590-20-72, 2-Dichloropropane 0.50 U 107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 122-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61, 1, 1-Trichloroethane 0.50 U 563-58-61, 1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51, 2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
74-97-5	107-06-2	1.2-Dichloroethane		
67-66-3				
56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			. 1	1
71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	79-01-6	Trichloroethene		
71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			- I	
74-95-3	71-43-2	Benzene	_ 1	
75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			0.50	U
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	10061-02-6	trans-1,3-Dichloropropene		
127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	79-00-5	1,1,2-Trichloroethane	0.50	U
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			0.50	ט
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			0.50	ַ
106-93-41,2-Dibromoethane 0.50 U	124-48-1	Dibromochloromethane	0.50	ע
			0.50	U
20			0.50	שׁ
913				
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EPA SAMPLE NO.

TW164

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-24

Sample wt/vol:

Lab File ID:

V5A3342

25.00 (g/mL) ML

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

CAS NO.

Soil Extract Volume: (uL)

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	
	0.50	_
136777-61-2m,p-Xylene	0.50	
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	_
75-25-2Bromoform		_
98-82-8Isopropylbenzene	0.50	, -
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	-
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	Ū
95-63-61,2,4-Trimethylbenzene	0.50	Ū
135-98-8sec-Butylbenzene	0.50	שׁ
541-73-11,3-Dichlorobenzene	0.50	שו
99-87-64-Isopropyltoluene	0.50	שו
106-46-71,4-Dichlorobenzene	0.50	שו
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U.O
96-12-81,2-Dibromo-3-chloropropane	0.50	20 15
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	1
87-61-61,2,3-Trichlorobenzene	0.50	_
1,2,3 IIIOIIIOIODOIIBOIO		~
	I	ــــــــــــــــــــــــــــــــــــــ

EPA SAMPLE NO.

TW165

Lab Name: MITKEM CORP.

Contract:

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-25

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID:

V5A3343

Level:

LOW

Soil Extract Volume: (uL)

(low/med)

Date Received: 04/07/98

Date Analyzed: 04/08/98

% Moisture: not dec.

ID: 0.25 (mm)

GC Column: DB-624

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

75-71-8	Dichlorodifluoromethane	0.50	ט
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	-
	1,1-Dichloroethene	0.50	
75-09-2	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
75-34-3	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	
	Bromochloromethane	0.50	
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
	1,2-Dichloropropane	0.50	III
71-43-2		0.50	
	Dibromomethane	0.50	II
	Bromodichloromethane	0.50	III
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.50	
	1,3-Dichloropropane	0.50	
	Dibromochloromethane	0.50	
	1, 2-Dibromoethane	0.50	1
	Chlorobenzene	0.50	_
100 00 /	011101000111101110	1	

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EPA SAMPLE NO.

TW165

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-25

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3343

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

630-20-6	1,1,1,2-Tetrachloroethane	0.50	U
100-41-4	Ethylbenzene	0.50	U
136777-61-2-	m,p-Xylene	0.50	U
	o-Xylene	0.50	U
100-42-5		0.50	U
	Bromoform	0.50	ט
	Isopropylbenzene	0.50	שו
	1,1,2,2-Tetrachloroethane	0.50	U
	Bromobenzene	0.50	U
	1,2,3-Trichloropropane	0.50	U
	n-Propylbenzene	0.50	U
	2-Chlorotoluene	0.50	U
108-67-8	1,3,5-Trimethylbenzene	0.50	U
	4-Chlorotoluene	0.50	U
98-06-6	tert-Butylbenzene	0.50	U
	1,2,4-Trimethylbenzene	0.50	ט
	sec-Butylbenzene	0.50	U
	1,3-Dichlorobenzene	0.50	U
	4-Isopropyltoluene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
	n-Butylbenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	
96-12-8	1,2-Dibromo-3-chloropropane	0.50	ʊ / `
120-82-1	1,2,4-Trichlorobenzene	0.50	U
	Hexachlorobutadiene	0.50	U
	Naphthalene	0.50	[ט
87-61-6	1,2,3-Trichlorobenzene	0.50	U

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EPA SAMPLE NO.

TW165RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-25RE

Sample wt/vol:

LOW

Lab File ID:

V5A3365

Level:

25.00 (g/mL) ML

(low/med)

Date Received: 04/07/98

% Moisture: not dec. ____

CAS NO.

Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

75_71_8	Dichlorodifluoromethane	0.50	U
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
	Methylene Chloride	4.2	.pt/
	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	1
75-34-3	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	
	Bromochloromethane	0.50	
67-66-3		0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
	1,2-Dichloropropane	0.50	
71-43-2		0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	Ū
	Tetrachloroethene	0.50	ΙŪ
	1,3-Dichloropropane	0.50	
	Dibromochloromethane	0.50	
	1,2-Dibromoethane	0.50	
	Chlorobenzene	0.50	
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		0.4	

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EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

TW165RE

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-25RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3365

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	U
100-41-4Ethylbenzene	0.50	U
136777-61-2m,p-Xylene	0.50	U
95-47-6o-Xylene	0.50	U
100-42-5Styrene	0.50	υ
75-25-2Bromoform	0.50	U
98-82-8Isopropylbenzene	0.50	Ū
79-34-51,1,2,2-Tetrachloroethane	0.50	שׁ
108-86-1Bromobenzene	0.50	שׁ
96-18-41,2,3-Trichloropropane	0.50	U
103-65-1n-Propylbenzene	0.50	lυ
95-49-82-Chlorotoluene	0.50	שׁ
108-67-81,3,5-Trimethylbenzene	0.50	שׁ
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	ט
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	ט
95-50-11,2-Dichlorobenzene	0.50	U,
96-12-81,2-Dibromo-3-chloropropane	_ 0.50	BI
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U
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		-

EPA SAMPLE NO.

TW166

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-26

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3366

Level: (low/med) LOW

Date Analyzed: 04/09/98

Date Received: 04/07/98

% Moisture: not dec.

Dilution Factor: 1.0

GC Column: DB-624

ID: 0.25 (mm) Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

75-71-8	Dichlorodifluoromethane	0.50 U	
	Chloromethane	0.50 U	
75-01-4	Vinyl Chloride	0.50 U	
74-83-9	Bromomethane	0.50 บ	
75-00-3	Chloroethane	0.50\U	
75-69-4	Trichlorofluoromethane	0.50 U	
75-35-4	1,1-Dichloroethene	0.50 U	
	Methylene Chloride	4.2 B	U
156-60-5	trans-1,2-Dichloroethene	0.50 U	
1634-04-4	Methyl tert-butyl ether	0.50 U	
	1,1-Dichloroethane	0.50 U	
156-59-2	cis-1,2-Dichloroethene	0.50 U	
590-20-7	2,2-Dichloropropane	0.50 บ	
107-06-2	1,2-Dichloroethane	0.50 U	
74-97-5	Bromochloromethane	0.50 U	
67-66-3	Chloroform	.0.50 U	
	Carbon Tetrachloride	0.50 U	- -,
71-55-6	1,1,1-Trichloroethane	0.49∤J	Ż
563-58-6	1,1-Dichloropropene	0.500	
	Trichloroethene	0.50 U	
78-87-5	1,2-Dichloropropane	0.50 U	
	Benzene	0.50 U	
	Dibromomethane	0.50 U	
	Bromodichloromethane	0.50 U	
	cis-1,3-Dichloropropene	0.50 U	
108-88-3		0.50 U	
	trans-1,3-Dichloropropene	0.50 U	
	1,1,2-Trichloroethane	0.50 U	
	Tetrachloroethene	0.50 U	
	1,3-Dichloropropane	0.50 U	
	Dibromochloromethane	0.50 U	
	1,2-Dibromoethane	0.50 U	
108-90-7	Chlorobenzene	0.50 U	

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EPA SAMPLE NO.

TW166

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-26

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3366

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(CAS NO.	COMPOUND	(ug/L or	ug/Kg)	UG/L	Q
	630-20-6 100-41-4 136777-61-2 95-47-6 75-25-2 98-82-8 79-34-5 108-86-1 108-86-1 96-18-4 95-49-8 108-67-8 106-43-4 95-63-6 135-98-8 135-98-8 135-98-8 106-46-7 99-87-6 104-51-8 95-50-1 96-12-8 87-68-3	-1,1,1,2-Tetrachlo -Ethylbenzene -m,p-Xylene -o-Xylene -Styrene -Bromoform -Isopropylbenzene -1,1,2,2-Tetrachlo -Bromobenzene -1,2,3-Trichloropr -n-Propylbenzene -2-Chlorotoluene -1,3,5-Trimethylbe -4-Chlorotoluene -tert-Butylbenzene -1,2,4-Trimethylbe -sec-Butylbenzene -1,2,4-Trimethylbe -4-Isopropyltoluene -1,4-Dichlorobenze -1,4-Dichlorobenze -1,2-Dichlorobenze -1,2-Dichlorobenze -1,2-Dichlorobenze -1,2-Trichlorobe -1,2,4-Trichlorobe -1,2,4-Trichlorobe -1,2,4-Trichlorobe -1,2,4-Trichlorobe	enzene enzene enzene enzene enzene enzene ene		0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	
. —						

EPA SAMPLE NO.

TW166RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-26RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3499

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50 ប
74-87-3	Chloromethane	0.50 U
75-01-4	Vinyl Chloride	0.50 U
74-83-9	Bromomethane	0.50 U
75-00-3	Chloroethane	0.50 U
	Trichlorofluoromethane	0.50 ע
75-35-4	1,1-Dichloroethene	0.50 U
	Methylene Chloride	0.50 U
.56 - 60-5	trans-1,2-Dichloroethene	0.50 U
634-04-4	Methyl tert-butyl ether	0.50 U
	1,1-Dichloroethane	0.50 U
.56-59-2	cis-1,2-Dichloroethene	0.50 U
	2,2-Dichloropropane	0.50 U
	1,2-Dichloroethane	0.50 U
	Bromochloromethane	0.50 U
	Chloroform	0.50 U
	Carbon Tetrachloride	0.50 ป
	1,1,1-Trichloroethane	0.51
63-58-6	1,1-Dichloropropene	0.50 \ U
79-01-6	Trichloroethene	0.50 U
'8-87-5	1,2-Dichloropropane	0.50 U
	Benzene	0.50 U
	Dibromomethane	0.50 U
	Bromodichloromethane	0.50 U
	cis-1,3-Dichloropropene	0.50 U
	Toluene	0.50 U
.0061-02-6	trans-1,3-Dichloropropene	0.50 U
	1,1,2-Trichloroethane	0.50 U
	Tetrachloroethene	0.50 U
	1,3-Dichloropropane	0.50 U
	Dibromochloromethane	0.50 U
	1,2-Dibromoethane	0.50 U
.08-90-7	Chlorobenzene	0.50 U

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FORM I VOA

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

TW166RE

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-26RE

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3499

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	_
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	•
75-25-2Bromoform	0.50	_
98-82-8Isopropylbenzene	0.50	1
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	•
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	i e
95-49-82-Chlorotoluene	0.50	! -
108-67-81,3,5-Trimethylbenzene	0.50	1 -
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	Ū
95-63-61,2,4-Trimethylbenzene	0.50	-
135-98-8sec-Butylbenzene	0.50	_
541-73-11,3-Dichlorobenzene	0.50	-
99-87-64-Isopropyltoluene	0.50	_
106-46-71,4-Dichlorobenzene	0.50	-
104-51-8n-Butylbenzene	0.50	_
95-50-11,2-Dichlorobenzene	0.50	
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	-
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	1
87-61-61,2,3-Trichlorobenzene	0.50	וּע
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EPA SAMPLE NO.

Lab Name: MITKEM CORP. Contract: TW167

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER Lab Sample ID: E0475-27

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3367

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

75-71-8Dichlorodifluoromethane 74-87-3Chloromethane 75-01-4Vinyl Chloride 74-83-9Bromomethane 75-00-3Chloroethane	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U
75-69-4Trichlorofluoromethane	0.50 U 0.50 U 4.3 B U 0.50 U 0.50 U 0.50 U
156-59-2cis-1,2-Dichloroethene 590-20-72,2-Dichloropropane 107-06-21,2-Dichloroethane 74-97-5Bromochloromethane 67-66-3Chloroform 56-23-5Carbon Tetrachloride	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U
71-55-61,1,1-Trichloroethane 563-58-61,1-Dichloropropene 79-01-6Trichloroethene 78-87-51,2-Dichloropropane 71-43-2Benzene 74-95-3Dibromomethane	0.51 0.50 0.50 0.50 0.50 0.50 0.50
75-27-4Bromodichloromethane 10061-01-5cis-1,3-Dichloropropene 108-88-3Toluene 10061-02-6trans-1,3-Dichloropropene 79-00-51,1,2-Trichloroethane 127-18-4Tetrachloroethene	0.50 U 0.50 U 0.33 J / 0.50 U 0.50 U 0.50 U
142-28-91,3-Dichloropropane 124-48-1Dibromochloromethane 106-93-41,2-Dibromoethane 108-90-7Chlorobenzene	0.50 U 0.50 U 0.50 U 0.50 U
	220-

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FORM I VOA

EPA SAMPLE NO.

TW167

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-27

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3367

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

		r
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	d aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
104-51-8n-Butylbenzene 95-50-11,2-Dichlorobenzene	0.50 0.50	טטט טטטט טטטט

EPA SAMPLE NO.

TW167RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-27RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3500

Level:

LOW

Date Received: 04/07/98

(low/med)

Date Analyzed: 04/12/98

% Moisture: not dec.

ID: 0.25 (mm)

Dilution Factor: 1.0

GC Column: DB-624

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

75-71-8Dichlorodifluoromethane	0.50	
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	U
74-83-9Bromomethane	0.50	U
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	U
75-35-41,1-Dichloroethene	0.50	U
75-09-2Methylene Chloride	0.50	U
156-60-5trans-1,2-Dichloroethene	0.50	U
1634-04-4Methyl tert-butyl ether	0.50	U
75-34-31,1-Dichloroethane	0.50	U
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	_
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.50	
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	-
75-27-4Bromodichloromethane	0.50	_
10061-01-5cis-1,3-Dichloropropene	0.50	_
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	
100 70 / Chitotobelizelle	0.50	ا آ
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EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

TW167RE

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-27RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V5A3500

Level:

(low/med) LOW

Soil Extract Volume: (uL)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene	0.50 0.50 0.50	U
95-47-6	0.50 0.50 0.50 0.50	ט ט
79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene 96-18-41,2,3-Trichloropropane	0.50 0.50 0.50	บ บ บ
103-65-1n-Propylbenzene 95-49-82-Chlorotoluene 108-67-81,3,5-Trimethylbenzene 106-43-44-Chlorotoluene	0.50 0.50 0.50 0.50	ם ט ט
98-06-6tert-Butylbenzene 95-63-61,2,4-Trimethylbenzene 135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene	0.50 0.50 0.50 0.50	บ บ
99-87-64-Isopropyltoluene 106-46-71,4-Dichlorobenzene 104-51-8n-Butylbenzene 95-50-11,2-Dichlorobenzene	0.50 0.50 0.50 0.50	U U
96-12-81,2-Dibromo-3-chloropropane 120-82-11,2,4-Trichlorobenzene 87-68-3Hexachlorobutadiene	0.50 0.50 0.50	U U U
91-20-3Naphthalene 87-61-61,2,3-Trichlorobenzene	0.50 0.50	1

EPA SAMPLE NO.

TW168

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-28

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V5A3368

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

75-71-8Dichlorodifluoromethane 0.50 U 74-87-3Chloromethane 0.50 U 75-01-4Vinyl Chloride 0.50 U 75-00-3Chloroethane 0.50 U 75-00-3		
10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.31 J 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	74-87-3	0.50 0.50
78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.31 J 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	156-59-2cis-1,2-Dichloroethene 590-20-72,2-Dichloropropane 107-06-21,2-Dichloroethane 74-97-5Bromochloromethane 67-66-3Carbon Tetrachloride 71-55-61,1,1-Trichloroethane 563-58-61,1-Dichloropropene	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U
142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	78-87-51,2-Dichloropropane 71-43-2Benzene 74-95-3Bromomethane 75-27-4Bromodichloromethane 10061-01-5cis-1,3-Dichloropropene 108-88-3Toluene 10061-02-6trans-1,3-Dichloropropene 79-00-51,1,2-Trichloroethane	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.31 J
	127-18-4Tetrachloroethene 142-28-91,3-Dichloropropane 124-48-1Dibromochloromethane 106-93-41,2-Dibromoethane	0.50 U 0.50 U 0.50 U 0.50 U

EPA SAMPLE NO.

TW168

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-28

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3368

Level:

(low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L COMPOUND

		
630-20-61,1,1,2-Tetrachloroethan	e 0.50	TT
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	l —
95-47-6	0.50	_
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	-
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethan		f -
108-86-1Bromobenzene	0.50	1 -
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene		_
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	1
95-63-61,2,4-Trimethylbenzene	0.50	~
135-98-8sec-Butylbenzene	0.50	I -
	0.50	
541-73-11,3-Dichlorobenzene	0.50	
99-87-64-Isopropyltoluene	0.50 0.50	
106-46-71,4-Dichlorobenzene	0.50	
104-51-8n-Butylbenzene	0.50	-
95-50-11,2-Dichlorobenzene		JAK.
96-12-81,2-Dibromo-3-chloroprop	oane_ 0.50 0.50	
120-82-11,2,4-Trichlorobenzene		
87-68-3Hexachlorobutadiene	0.50	_
91-20-3Naphthalene	0.50	_
87-61-61,2,3-Trichlorobenzene_	0.50	١٥

EPA SAMPLE NO.

TW168RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-28RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3501

Level:

Date Received: 04/07/98

(low/med) LOW

Date Analyzed: 04/12/98

% Moisture: not dec.

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	ט
74-87-3Chloromethane	0.50	ט
75-01-4Vinyl Chloride	0.50	U
74-83-9Bromomethane	0.50	U I
75-00-3Chloroethane	0.50	U I
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	_
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	-
156-59-2cis-1,2-Dichloroethene	0.50	-
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	-
71-55-61,1,1-Trichloroethane	0.50	_
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	
71-43-2Benzene	0.50	-
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	ltī
142-28-91,3-Dichloropropane	0.50	_
124-48-1Dibromochloromethane	0.50	N .
106-93-41,2-Dibromoethane	0.50	-
108-90-7Chlorobenzene	0.50	1 -
TOO-AO-1CHTOTOPEHTEHE	-1	١٦

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EPA SAMPLE NO.

TW168RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-28RE

Sample wt/vol:

LOW

Lab File ID:

V5A3501

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

25.00 (g/mL) ML

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

The state of the s		
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene	0.50 0.50 0.50	บ บ
95-47-6	0.50 0.50 0.50 0.50	บ บ
79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene 96-18-41,2,3-Trichloropropane 103-65-1n-Propylbenzene	0.50 0.50 0.50	บ บ
95-49-82-Chlorotoluene 108-67-81,3,5-Trimethylbenzene 106-43-44-Chlorotoluene 98-06-6tert-Butylbenzene	0.50 0.50 0.50 0.50	บ บ
95-63-61,2,4-Trimethylbenzene 135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene 99-87-64-Isopropyltoluene	0.50 0.50 0.50 0.50	บ บ บ
106-46-71,4-Dichlorobenzene 104-51-8n-Butylbenzene 95-50-11,2-Dichlorobenzene	0.50 0.50 0.50 0.50	n n
96-12-81,2-Dibromo-3-chloropropane 120-82-11,2,4-Trichlorobenzene 87-68-3Hexachlorobutadiene 91-20-3Naphthalene 87-61-61,2,3-Trichlorobenzene	0.50 0.50 0.50 0.50	U U
0/-01-0		<u> </u>

EPA SAMPLE NO.

TW169

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-29

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3369

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/09/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

74-87-3 75-01-4 74-83-9 75-00-3	-Vinyl Chloride -Bromomethane -Chloroethane -Trichlorofluoromethane -1,1-Dichloroethene	0.50 0.50 0.50 0.50 0.50 0.50	บ บ บ บ
74-87-3 75-01-4 74-83-9 75-00-3	Chloromethane Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane	0.50 0.50 0.50 0.50 0.50	บ บ บ บ
75-01-4 74-83-9 75-00-3	-Vinyl Chloride -Bromomethane -Chloroethane -Trichlorofluoromethane -1,1-Dichloroethene	0.50 0.50 0.50 0.50 0.50	U U U U
74-83-9 75-00-3	Bromomethane Chloroethane Trichlorofluoromethane 1,1-Dichloroethene	0.50 0.50 0.50 0.50	บ บ บ
75-00-3	-Chloroethane -Trichlorofluoromethane -1,1-Dichloroethene	0.50 0.50 0.50	บ บ
	Trichlorofluoromethane	0.50 0.50	Ū
/5-69-4	-1,1-Dichloroethene	0.50	
			U.
75-09-2	Metrorie Chroride	3.8	BU
	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
	1,1-Dichloroethane	0.50	_
	cis-1,2-Dichloroethene	0.50	
590-20-7	-2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	1
74-97-5	Bromochloromethane	0.50	
67-66-3		0.50	1
	-Carbon Tetrachloride	0.50	
	-1,1,1-Trichloroethane	0.50	
563-58-6	-1,1-Dichloropropene	0.50	
79-01-6	-Trichloroethene	0.50	
	-1,2-Dichloropropane	0.50	1
71-43-2		0.50	1
74-95-3	-Dibromomethane	0.50	U
75-27-4	-Bromodichloromethane	0.50	U
	-cis-1,3-Dichloropropene	0.50	U
108-88-3		0.50	U
10061-02-6	-trans-1,3-Dichloropropene	0.50	U
79-00-5	-1,1,2-Trichloroethane	0.50	U
	-Tetrachloroethene	0.50	שׁ
142-28-9	-1,3-Dichloropropane	0.50	ט
124-48-1	-Dibromochloromethane	0.50	ט
106-93-4	-1,2-Dibromoethane	0.50	ע
108-90-7	-Chlorobenzene	0.50	ש
			<u> </u>

FORM I VOA

EPA SAMPLE NO.

TW169

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-29

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3369

COMPOUND

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CAS NO.

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	akaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
95-50-11,2-Dichlorobenzene 96-12-81,2-Dibromo-3-chloropropane	0.50	ם מ גע (

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EPA SAMPLE NO.

TW169RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-29RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3502

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

		,
75-71-8	0.50 0.50	ממממממממממממממממממממממ
75-27-4Bromodichloromethane 10061-01-5cis-1,3-Dichloropropene 108-88-3Toluene 10061-02-6trans-1,3-Dichloropropene	0.50 0.50 0.50 0.50	ממטמטטטטטט

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FORM I VOA

EPA SAMPLE NO.

TW169RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-29RE

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3502

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

CAS NO. COMPOUND

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

EPA SAMPLE NO.

TW170

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-30

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3370

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624

CAS NO.

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

75-71-8	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50
75-34-31,1-Dichloroethane	0.50 U
590-20-72,2-Dichloropropane 107-06-21,2-Dichloroethane	0.50 U
74-97-5Bromochloromethane 67-66-3Chloroform	0.50 U
71-55-61,1,1-Trichloroethane	0.50 U
79-01-6Trichloroethene 78-87-51,2-Dichloropropane	0.50 U 0.50 U
71-43-2Benzene	0.50 U 0.50 U 0.50 U
10061-01-5cis-1,3-Dichloropropene 108-88-3Toluene	0.50 U 0.50 U
10061-02-6trans-1,3-Dichloropropene79-00-51,1,2-Trichloroethane127-18-4Tetrachloroethene	0.50 U 0.50 U 0.50 U
142-28-91,3-Dichloropropane	0.50 U 0.50 U
106-93-41,2-Dibromoethane 108-90-7Chlorobenzene	0.50 U 0.50 U

FORM I VOA

EPA SAMPLE NO.

TW170

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

LOW

SDG No.: E0475

Matrix: (soil/water) WATER

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3370

Level: (low/med)

Date Received: 04/07/98

Lab Sample ID: E0475-30

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm)

CAS NO.

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

		T
630-20-61,1,1,2-Tetrachloroethane	0.50	TT .
100-41-4Ethylbenzene	0.50	i
136777-61-2m,p-Xylene	0.50	_
95-47-6	- 0.50	L
	- 0.50	-
100-42-5Styrene	0.50	l .
	0.50	1 -
98-82-8Isopropylbenzene	0.50	1 -
79-34-51,1,2,2-Tetrachloroethane	_1	-
108-86-1Bromobenzene	0.50	-
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	1
95-49-82-Chlorotoluene	0.50	~
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	Up
96-12-81,2-Dibromo-3-chloropropane		8
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	שו
2,2,0	-	

EPA SAMPLE NO.

TW170RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-30RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3503

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

75-71-8Dichlorodifluoromethane	0.50	U
74-87-3Chloromethane	0.50	U
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane		
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	_
1634-04-4Methyl tert-butyl ether	0.50	-
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	_
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.50	U
563-58-61,1-Dichloropropene	0.50	Ū
79-01-6Trichloroethene	0.50	U
78-87-51,2-Dichloropropane	0.50	U
71-43-2Benzene	0.50	U
74-95-3Dibromomethane	0.50	U
75-27-4Bromodichloromethane	0.50	U
10061-01-5cis-1,3-Dichloropropene	0.50	U
108-88-3Toluene	0.50	U
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene		1
142-28-91,3-Dichloropropane	0.50	1
124-48-1Dibromochloromethane	0.50	_
106-93-41,2-Dibromoethane	0.50	Ü
108-90-7Chlorobenzene	0.50	υ
Too yo , Chilotobelizelie	0.50	١
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FORM I VOA

EPA SAMPLE NO.

TW170RE

Lab Name: MITKEM CORP. Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-30RE

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3503

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

EPA SAMPLE NO.

TW171

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-31

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3371

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

74-87-3		0 1	0.50		difluoromethane	Dichlorodif	75_71_0
75-01-4							
74-83-9							
75-00-3				,			
75-69-4				·			
75-35-4							
75-09-2Methylene Chloride 3.8 B 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-22,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 79-01-6Trichloropropene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U 122-18-41,3-Dichloropropane 0.50 U							
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.56 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 74-95-3Bromodichloromethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 10061-02-6							
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.56 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U				ļ			
75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.56 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U		- 1					
156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.56 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U							
590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.56 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U		- 1		[
107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.56 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U							
74-97-5							
67-66-3				İ			
56-23-5							
71-55-61,1,1-Trichloroethane 0.56 563-58-61,1-Dichloropropene 0.50 79-01-6Trichloroethene 0.50 78-87-51,2-Dichloropropane 0.50 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 75-27-4Bromodichloromethane 0.50 10061-01-5cis-1,3-Dichloropropene 0.50 108-88-3Toluene 0.50 10061-02-6trans-1,3-Dichloropropene 0.50 79-00-51,1,2-Trichloroethane 0.50 127-18-4Tetrachloroethene 0.50 142-28-91,3-Dichloropropane 0.50		ı					
563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U	-	· '					
79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U	}	6	0.56				
78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U							
71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5Cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U		0 T	0.50				
74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U	,	iO I	0.50		loropropane	1,2-Dichlor	78-87-5
75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U		io t	0.50			Benzene	71-43-2
10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U	•	io t	0.50		ethane	Dibromometh	74-95-3
108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethane 0.50 U 142-28-91,3-Dichloropropane 0.50 U		io t	0.50		hloromethane	Bromodichlo	75-27-4
10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U		io t	0.50		Dichloropropene	cis-1,3-Dic	10061-01-5
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U		0 T	0.50			Toluene	108-88-3
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U	•	0 1	0.50		3-Dichloropropene	trans-1,3-D	10061-02-6
127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U		0 1	0.50		ichloroethane	1.1.2-Trich	79-00-5
142-28-91,3-Dichloropropane 0.50 U							
124-48-1Dibromochloromethane 0.50 U	•		0.50				
106-93-41,2-Dibromoethane 0.50 U		- 1					
108-90-7Chlorobenzene 0.50 U							

FORM I VOA

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW171

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-31

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3371

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	adadaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
120-82-11,2,4-Trichlorobenzene	0.50	U U U

TW171RE

Lab Name: MITKEM CORP.

Contract:

Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-31RE

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID: V5A3504

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

75-71-8			
75-01-4	75-71-8Dichlorodifluoromethane	0.50	J
75-01-4Vinyl Chloride 0.50 U 74-83-9Bromomethane 0.50 U 75-00-3Chloroethane 0.50 U 75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 107-06-21,2-Dichloroethane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 66-6-3	74-87-3Chloromethane	0.50 0	J
74-83-9		0.50 0	Ĵ
75-00-3		0.50 1	J
75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 4-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 79-01-6		II	
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5			
75-09-2			
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloroethane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-28-91,1,2-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50 t	Ū
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.57 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6		Į.	_
75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.57 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5sis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 107-18-4Tetrachloroethane 0.50 U 127-18-4			Ū
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67-66-3			_
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78-87-51, 2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1, 3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1, 3-Dichloropropene 0.50 U 79-00-51, 1, 2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91, 3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41, 2-Dibromoethane 0.50 U		l l	
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74-95-3		- 1	-
75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			_
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79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			-
127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			-
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124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			_
106-93-41,2-Dibromoethane 0.50 U			_
108-90-7Chlorobenzene 0.50 U			_
	108-90-7Chlorobenzene	0.50	U

See The criginal sample

FORM I VOA

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW171RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-31RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3504

Level:

(low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane 0.50 U 100-41-4Ethylbenzene 0.50 U 136777-61-2m,p-Xylene 0.50 U 95-47-6	
100-41-4Ethylbenzene 0.50 U 136777-61-2m, p-Xylene 0.50 U 95-47-6	
136777-61-2m,p-Xylene 0.50 U 95-47-6	
95-47-6	
100-42-5Styrene 0.50 U 75-25-2Bromoform 0.50 U 98-82-8Isopropylbenzene 0.50 U 79-34-51,1,2,2-Tetrachloroethane 0.50 U 108-86-1Bromobenzene 0.50 U 96-18-41,2,3-Trichloropropane 0.50 U 103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
75-25-2	
98-82-8	
79-34-51,1,2,2-Tetrachloroethane 0.50 U 108-86-1Bromobenzene 0.50 U 96-18-41,2,3-Trichloropropane 0.50 U 103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
108-86-1Bromobenzene 0.50 U 96-18-41,2,3-Trichloropropane 0.50 U 103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
96-18-41,2,3-Trichloropropane 0.50 U 103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U	
135-98-8sec-Butylbenzene 0.50 U	
135-98-8sec-Butylbenzene 0.50 U	
D4T-/3-TT,3-DICITOLODGIIZEIIE	
99-87-64-Isopropyltoluene 0.50 U	
106-46-71,4-Dichlorobenzene 0.50 U	
104-51-8n-Butylbenzene 0.50 U	
95-50-11,2-Dichlorobenzene0.50 U	1
96-12-81,2-Dibromo-3-chloropropane 0.50 Ø	١
120-82-11,2,4-Trichlorobenzene 0.50 U	
87-68-3Hexachlorobutadiene 0.50 U	
91-20-3Naphthalene 0.50 U	
87-61-61,2,3-Trichlorobenzene 0.50 U	

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TENTATIVELY	IDENTIFIED COMPOUNDS	TB02
Lab Name: MITKEM CORP.	Contract:	1502

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-01

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3305

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

30.

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

				<u> </u>
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1		-		l
2.				l
<u> </u>		·		
4		-	-	
5		-		
6		·		ļ
7				
8.				
10.				
11.		-		
12		-		
12.		-		l ———
13. 14.				
15.		-		
16.				
17.				
18.		-		
19.				-
20.				
21.		-		-
22.				
23.				
24.				

FORM I VOA-TIC

VOLATTLE ORGANICS ANALYSIS DATA SHEET

EPA	SAMPLE	NO.

		v —		~		
		7	TENTATIVELY	IDENTIFIED	COMPOUNDS	•
						TW 09
Lab	Name:	MITKEM	CORP.	Co	ontract:	

SAS No.: SDG No.: E0475 Lab Code: MITKEM Case No.:

Lab Sample ID: E0475-02 Matrix: (soil/water) WATER

Lab File ID: Sample wt/vol: 25.00 (g/mL) ML V5A3306

Date Received: 04/07/98 Level: (low/med) LOW

% Moisture: not dec. Date Analyzed: 04/07/98

Dilution Factor: 1.0 GC Column: DB-624 ID: 0.25

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

> CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST.	CONC.	Q
1.	UNKNOWN	14.20	======	2.5	3/
2					
4. 5.					
6.					
7 8					
9.					
11.					
L3					
15.					
16 17.					
18.					
20.					
21.					
24.					
25 26					
27.					
29.					
30					

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TW10

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-03

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3307

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

Soil Aliquot Volume: ____(uL)

Number TICs found: 1

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT		CONC.	Q
1.	UNKNOWN	14.20		0.48	3 R
2. 3.					
5.					
7.					
9.——					
10.					
12					
15					
17.					
18					
21. 22. 23.					
24.					
26			·		
28.					
30					

FORM I VOA-TIC

EPA SAMPLE NO.

Lab N	Jame:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-04

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3308

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	14.51	1.0	3 K
2. 3. 4.				
5.				
7.				
9.				
10.				
12. 13.				
14. 15.				
16. 17. 18.		· · · · · · · · · · · · · · · · · · ·		
18 19 20				
21. 22.				
23				
25. 26.				
28.				
29. 30.				
				l

FORM I VOA-TIC

EPA SAMPLE NO.

TW12	
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Lab :	Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-05

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3309

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

LOW

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	14.31	2.5	
2.				<u> </u>
3				
4.			·	
J.				
.				
/ •				
8				
10				
11.				
14.				
±J.				
⊥4.				
1J.				
16.				
1/.		<u> </u>		
18		<u></u>		
20				
21				
22.				
23.				
24.				
∠ 5.				····
210.				
41.				
28				
30				
30			-	

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO
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TW13	

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-06

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V

V5A3310

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

boil Aliquot Volume. _____(ub)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	14.51	1.3	
2. 3. 4.				
4. 5.				
.				
8.				
9				
11. 12.				
1J.				
14. 15. 16.				
16. 17.				
19.				
20.				
21.			· · · · · · · · · · · · · · · · · · ·	
23.				
26.				
27. 28.				
49.				
30.				

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FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW14
TMT 4

Lab Name: MITKEM CORI	Lab	Name:	MITKEM	CORP
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Contract:

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-07

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID:

V5A3311

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1		=======		
2				
3.				
· ·				
5		_		
6.		_		
7				
0.		_		<u> </u>
9.		-		
.0				
2		· .		
.J.				
4. .5.				
.5		_		
<u> </u>		_		
L/.		_		
LO.		-		
LJ.		_		
		_	-	
21.	- Aller - Grand			
23.				
4 4 •				
25.		_		
26.		_	·	
27.		_		
28.		_		ļ ———
		_		
··		_		

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FORM I VOA-TIC

EPA SAMPLE NO.

•	1
TW15	
	ŀ

Lab Name: MITKEM COR	Ρ.	Contract:	
Lab Code: MITKEM	Case No.:	SAS No.: SDG	No.: E0475
Matrix: (soil/water)	WATER	Lab Sample ID	: E0475-08
Sample wt/vol:	25.00 (g/mL) ML	Lab File ID:	V5A3324
Level: (low/med)	LOW	Date Received	: 04/07/98
% Moisture: not dec.		Date Analyzed	: 04/07/98
GC Column: DB-624	ID: 0.25 (mm)	Dilution Fact	or: 1.0

Soil Extract Volume: ____(uL)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
2. 3. 4.				
6. — –				
8. — —				
10.				
12.				
14.				
16.				
17. 18. 19.				
21.				
22.				
24. 25.				
27.				
28.				
30				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

		T	ENTATIVELY	IDENTIFIED	COMPOUNDS			
							TW155	
Lab	Name:	MITKEM	CORP.	Co	ntract:	i		

Lab Code: MITKEM Case No.: SDG No.: E0475 SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: E0475-15

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3333

Level: (low/med) LOW Date Received: 04/07/98

Date Analyzed: 04/08/98 % Moisture: not dec. _____

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL) Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
$\frac{1}{2}$.	NKNOMN	14.31	0.55	JE K
4.				
5. 6. 7.				
9.——				
10.				
13. 14. 15.				
17.				
20.				
21.				
23				
26. 27. 28.				
29.				

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FORM I VOA-TIC

EPA SAMPLE NO.

TW156

Lab	Name:	MITKEM	CORP.

Contract:

TW156	

Lab Code: MITKEM

Case No.:

SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-16

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3334

Level: (low/med) LOW

% Moisture: not dec.

Date Received: 04/07/98

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER COMPOUND NAME RTEST. CONC. Q ______ _____ ======= 4._ 5._ 7._ 10. 11. 12. 13. 14._ 15. 16. 17. 19. 20. 21. 22. 23._ 24.__ 25._ 26._ 27. 28. 29. 30.

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

		TENTATIVELY	IDENTIFIED	COMPOUNDS	
Lab Nam	e: MITKEM	CORP.	Co	ontract:	TW157

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER Lab Sample ID: E0475-17

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3335

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Number TICs found: 0

30.

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

RT EST. CONC. CAS NUMBER COMPOUND NAME _____ 10.___ 11.____ 13._ 14. 15. 16. 17. 18._ 19._ 20.____ 21.___ 26. 27._ 28._ 29.

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FORM I VOA-TIC

Lab	Name:	MITKEM	CORP.

Contract:

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-18

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID:

V5A3336

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 0

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	_
1				
2				
3.		_		
4.				
5				
0.				
7.				
8				
9.				
10.				
L_L • !		_		
L4.		_		
13.				-
4				
15.				
16.		_		
L / •				
LO.				
L9		_		
21				
22.				
23.				
24.				
25				
26				
27.				
28				
29			•	
30.		-		

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

CPA	SHITE	NO.
1		

Soil Aliquot Volume: ____(uL)

Lab Name: MITKEM CORP.	Contract	:	
Lab Code: MITKEM Case	No.: SAS No.	: SDG 1	No.: E0475
Matrix: (soil/water) WATE	ER .	Lab Sample ID:	E0475-19
Sample wt/vol: 25.0	00 (g/mL) ML	Lab File ID:	V5A3337
Level: (low/med) LOW		Date Received:	04/07/98
% Moisture: not dec	·	Date Analyzed:	04/08/98
GC Column: DB-624 ID:	0.25 (mm)	Dilution Factor	r: 1.0

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Soil Extract Volume: (uL)

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
2.				
اا				
5.	•			
6.				
/·				
8. 9.				i
10.				
L1. I				
12.				
13.	·			
15.				
16.				
17.				
19.				
4U.				
21				
43.				
4 4.				
43.				
26.				
28.				
49.				
30.				

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FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

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TW16

Lab Name: MITKEM COR	?. (Contract:	
Lab Code: MITKEM	Case No.:	SAS No.: SDG	No.: E0475
Matrix: (soil/water)	WATER	Lab Sample ID	: E0475-09
Sample wt/vol:	25.00 (g/mL) ML	Lab File ID:	V5A3327
Level: (low/med)	LOW	Date Received	: 04/07/98
% Moisture: not dec.		Date Analyzed	: 04/07/98
GC Column: DB-624	ID: 0.25 (mm)	Dilution Facto	or: 1.0
Soil Extract Volume:	(uL)	Soil Aliquot V	Volume:(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	iknown	14.62	1.9	OB R
2				
4.				
5				
6. 7.				
0.				
9	·			
L.L. •				
12.				
L4.				
15.				-
L6				
L8.				
20.				
ú⊥•				
22.				
44.				
25. I				
26.				
40.				l

FORM I VOA-TIC

EPA SAMPLE NO.

		TW160
Lab Name: MITKEM CORP.	Contract:	

Case No.: SAS No.: SDG No.: E0475 Lab Code: MITKEM

Matrix: (soil/water) WATER Lab Sample ID: E0475-20

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3338

(low/med) Date Received: 04/07/98 Level: LOW

% Moisture: not dec. Date Analyzed: 04/08/98

GC Column: DB-624 Dilution Factor: 1.0 ID: 0.25 (mm)

Soil Extract Volume: (uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1		= =======	=========	====
2.		_		
3				
4.				
5.		_		
6		_		
7.		_		
J.				
.0				
.1.				
.2.				
3				
4				
5.		<u> </u>		
_/.				
.0.				
.9.				
20.				
21.				
43.				
44.				
25.				
26.		_		
28.				
.y		_		
30.				

FORM I VOA-TIC

EPA SAMPLE NO.

TW161	
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Lab	Name:	MITKEM	CORP
	Tacallic .		

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-21

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3339

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Number TICs found: 0

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
2		- 		
·		-		
4		-		
5		-		
6		-		
7.		-		
8.				
9.		-		l
10.				
L L •		_		
L 4 .				
L# .		_		
LJ.		_		
LO.		_		
17.				
LB.		_		
19.				
20		_		
21.		-\		
22		_		
١ .		_ -		
24		_		l
· I		_		l
40.		_		
4 / •		_		1
20.		_		
29				
30		_		
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FORM I VOA-TIC

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EPA SAMPLE NO.

TW162	
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Lab Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-22

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3340

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
4.				
5. 6. 7.				
9:				
11.				
12. 13. 14.				
16.				
17. 18. 19.				
20.				
22				
25. 26.				
27				
29. 30.				

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FORM I VOA-TIC

1 F

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW163	TW163	
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Lab Name: MITKEM CORI

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-23

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3341

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 0

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
i i		= ======	=========	====
1		_		 _
۷.		_		ļ
·		_		
J.		_		<u> </u>
· · · · · · · · · · · · · · · · · · ·				
7				l ——
8				
TO.				
11.	· · · · · · · · · · · · · · · · · · ·			
12.				
13.				
14.				
15.				ļ
16.				
10-				i
±2.	<u> </u>			
21.				<u> </u>
22				
				l
ZT.				l
25				
26				
41.				
28.				
29.				
30		_		
			4.00	I

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FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW164

Lab Name:	MITKEM	CORP.
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Lab Code: MITKEM

Contract:

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-24

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3342

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 0

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q =====
1.				
2.				
3				
∵.		ļ		l
5.				
0				
7				
8.				
10.				
⊥ ⊥• !				
12.				
13.				
14				
14 15				
16		· 		
17		·		
18		· 		
19.				l ———
21		-		
22. •				
23.				
<u>4</u> 4.				
25.		.		
26		.		
27		·		
28		·		<u> </u>
29		-		
30		-		l

FORM I VOA-TIC

EPA SAMPLE NO.

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TW165	

Lab Name:	MITKEM	CORP
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Contract:

Lab Code: MITKEM Case No.: SAS No.:

LOW

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-25

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V5A3343

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2.				
3.				
4.				
J.				
· · · · · · · · · · · · · · · · · · ·				
/ •				
0.				
9.				
10.				
				
14.				
±3.				
			-	
15.				
16				
19.				
20.				
ZI.				
44.				
23.				
24.				
25. I				
26.				
- · · · · · · · · · · · · · · · · · · ·				
∠8. I				
29.				
30				
		1		

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FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.
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TENTAT	CIVELY IDENTIFIED COMPOUNDS	TW165RE
Lab Name: MITKEM CORP.	Contract:	

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0475

Matrix: (soil/water) WATER Lab Sample ID: E0475-25RE

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3365

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. ____ Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76-13-1 2.	ETHANE, 1,1,2-TRICHLORO-1,2,	4.06	1.1	NDB (
2. 3. 4.				
7				
8. 9. 10.				
12.				
15.				
16. 17. 18.				
19. 20. 21.				
23.				
25				
29.				
30.				

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EPA SAMPLE NO.

TW166	

Lab Name: MITKEM CORP

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab File ID:

V5A3366

Sample wt/vol: 25.00 (g/mL) ML

Level: (low/med)

LOW

Date Received: 04/07/98

Lab Sample ID: E0475-26

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76-13-1 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.	COMPOUND NAME ETHANE, 1,1,2-TRICHLORO-1,2,	======	==========	
19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29.				

FORM I VOA-TIC

EPA SAMPLE NO.

TW166RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-26RE

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3499

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT =======	EST. CONC.	Q =====
1. 2. 3.				
5			<u> </u>	
8. 9.				
11.				
14.				
16. 17. 18.				
20.		:		
23.				
25. 26. 27.				
28. 29. 30.				

FORM I VOA-TIC

EPA SAMPLE NO.

I —	
1	•
]	TW167

Lab	Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-27

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3367

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

LOW

Date Analyzed: 04/09/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 2

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76-13-1 2. 3.	ETHANE, 1,1,2-TRICHLORO-1,2, UNKNOWN	4.20		NOBE
5. 6. 7.				
9. 10.				
12. 13. 14.				
16. 17. 18. 19.				
20. 21. 22. 23.				
24. 25. 26. 27.				
28. 29. 30.				

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW167RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-27RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3500

Level: (low/med)

% Moisture: not dec.

LOW

Date Received: 04/07/98

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
す・				
5.				
7				
9.				
10.				
12.				
10.				
14.				
16.				
17.				
19.				
20.				
22.		ļ		
Z4.				
25. 26.				
27.				
28.	<u> </u>			
30				
I				l

FORM I VOA-TIC

	- 1
•	- 1
TW168	ľ

T - }	NTomo -	MITKEM	CODD
Lab	Name:	MITIKEM	CURP.

Contract:

SAS No.: SDG No.: E0475 Lab Code: MITKEM Case No.:

Matrix: (soil/water) WATER

Lab Sample ID: E0475-28

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V5A3368

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 2 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76-13-1 2.	ETHANE, 1,1,2-TRICHLORO-1,2, UNKNOWN	4.06 14.20	1.3	NAB (
4. 5. 6. 7.				
9. 0. 1. 2.				
3. 4. 5.				
9. 0.				
1				
5 6 7.				
8. 9. 0.				

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.
-----	-------	--------	-------

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-28RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3501

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

		CONCENTRATION UNITS:
Number TICs found:	0	(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
4.				
5. 6. 7.				
8 9.				
10.				
14.				
16				
17. 18. 19.				
21.				
23				
25. 26.				
27. 28. 29.				
30				

FORM I VOA-TIC

Lab Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-29

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3369

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624 ID: 0.25 (mm)

Number TICs found: 2

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76-13-1 2. 3.	ETHANE, 1,1,2-TRICHLORO-1,2, UNKNOWN	4.06 14.20		NOBY
5				
8.				
10. 11. 12. 13.				
15.				
18.		:		
20. 21. 22. 23.				
24. 25. 26.				
27. 28. 29.				
30				

FORM I VOA-TIC

EPA SAMPLE NO.

TW169RE		
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-29RE

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3502

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

LOW

Date Analyzed: 04/12/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
4.				
6.				
7. 8. 9.				
11.				
13				
16.				
17. 18. 19.				
20.				
22.				
25. 26.				
28.				
29.				

FORM I VOA-TIC

TW17	
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-10

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3328

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2.	UNKNOWN	14.62	0.61	JB R
2. 3. 4.				
6. 7.				
9. 10.				
12.				
14				
17. 18.				
20.				
21. 22. 23.				
24. 25. 26.				
28.				
29. 30.				

FORM I VOA-TIC

ATILE ORGANICS ANALYSIS DATA SHEET TENTETTE COMPOUNDS

EPA SAMPLE NO.

IEMIAIIVEDI	IDENTIFIED CONTOUNDS	TW170RE
Lab Name: MITKEM CORP.	Contract:	

SDG No.: E0475 Case No.: SAS No.: Lab Code: MITKEM

Lab Sample ID: E0475-30RE Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3503

Date Received: 04/07/98 Level: (low/med) LOW

Date Analyzed: 04/12/98 % Moisture: not dec. _____

Dilution Factor: 1.0 ID: 0.25 (mm) GC Column: DB-624

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2.				
3				
6. 7. 8.				
9. 10. 11.				
13				
15 16				
18. 19. 20.				
22.				
24. 25. 26.				
27.				
30				

FORM I VOA-TIC

EPA SAM	

•	
TW171	

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-31

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3371

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/09/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1. 76-13-1 2. 3. 4. 5. 6. 7. 8. 9.	ETHANE, 1,1,2-TRICHLORO-1,2, UNKNOWN		1.2	
10. 11. 12. 13. 14. 15. 16. 17. 18. 19.				
20. 21. 22. 23. 24. 25. 26. 27. 28.				
29. 30.				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW171RE

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-31RE

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V5A3504

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

LOW

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q =====
1				
4				
7				
9. 10. 11.				
13.				
14. 15. 16.	·			· .
18.				
20				
23. 24. 25.				
26				
28. 29. 30.				

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TW18

Lab	Name:	MITKEM	CORP

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab File ID:

Lab Sample ID: E0475-11

Sample wt/vol: 25.00 (g/mL) ML

V5A3329

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q =====
1. 2.				
4				
7 8.				
9. 10. 11.				
13				
16. 17.				
19		· .		
21. 22. 23. 24				
24. 25. 26.				
27. 28.				
29 30				

FORM I VOA-TIC

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TW19	

Lab Name: M	ITKEM	CORP.
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Contract:

SAS No.:

Case No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-12

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID:

V5A3330

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 0

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
4.				
6.				
7. 8. 9.				
10.				
13.				
15.				
16. 17. 18.				
20.				
22.				
23. 24.				
25. 26. 27.				
29.				
30				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA	SAMPLE	NO.
ı		

		_	CEMINITAEDI	IDENTIFIED COMPOUNDS	TW20
Lab	Name:	MITKEM	CORP.	Contract:	1W20
Lab	Code:	MITKEM	Case No.	SAS No.: SDG	No.: E0475

Matrix: (soil/water) WATER Lab Sample ID: E0475-13

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V5A3331

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. Date Analyzed: 04/07/98

ID: 0.25 (mm) Dilution Factor: 1.0 GC Column: DB-624

Soil Aliquot Volume: ____(uL) Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
∠.				
4.				
5.				
7.				
0.				
9	·			
				
12.				
14.				
15. 16.				
± / •				
18.			· · · · · · · · · · · · · · · · · · ·	
20.				
21.				
23.				
24.				
∠ 6.				
27.				<u></u>
28.				
30				<u> </u>

FORM I VOA-TIC

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW21	

Contract:

Case No.:

SAS No.:

SDG No.: E0475

Matrix: (soil/water) WATER

Lab Sample ID: E0475-14

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V5A3332

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1		=======		
۷.	· · · · · · · · · · · · · · · · · · ·			
4.				
5				
6				
0.				
9.				
10.				
11. 12.				
13.				
TI.				
15.			<u> </u>	
16.			· · · · · · · · · · · · · · · · · · ·	
17.		<u> </u>		
±J.		l	-	
20.				
21.				
22.				
24.				
4.J.				
26.				
21.				
28.				
30.	<u> </u>			

FORM I VOA-TIC



$\begin{array}{c} \textbf{Appendix} \ \mathbb{D} \\ \textbf{Region II Work Sheet} \end{array}$

US EPA Region II Method: CLP/SOW CLMO3.1 Date: October 1995 SOP HW-6, Rev. 10

YES NO N/I

PACKAGE COMPLETENESS AND DELIVERABLES

	•		•	4414	α		
CASE	NUMBER	2:	LABORATORY:	Mit Keun (urf.		
SITE	NAME:	Smith town, long Island	SDG Number(s)	: <u> </u>	75	· · · ·	
		0					
1.0	Chain c	of Custody and Sampling Tr	rip Reports	•			
	1.1	Are the Traffic Reports/Opresent for all samples?	Chain-of-Custody	Records	IN	_	
	ACTION	N: If no, contact lab for or illegible copies.	replacement of	missing			
	1.2	Is the Sampling Trip Repo		all	тĄ		
	ACTIO	N: If no, contact either F contractor for this inf		е			
2.0	Data C	ompleteness and Deliverab	Les				
	2.1	Have any missing delivers added to the data package		ved and			
-	NOTE:	The lab is required to sure analyses, for each fraction sample and one dilution, concentrated dilution and dilution.)	ion. (i.e., the or, from the mo	original st			
	ACTIO	N: Call lab for an explant any missing deliverable provide them, note the package under the Cont- section of the Data As Regional Data Assessme	es. If lab cann effect on revie ract Non- compli sessment and the	ot w of the ance			
	2.2	Was CLASS CCS checklist	included with pa	ıckage?	\Box		<u>/</u>
	2.3	Are there any discrepanc Reports/Chain-of-Custody and Sample Tags?				T V	_
	ACTIC	ON: If yes, contract the less explanation or resubmit deliverables.					

US EPA Region II Method: CLP/SOW OLMO3.1 Date: October 1995 SOP HW-6, Rev. 10

			YES	МО	D
3.0 <u>¢</u>	Cover I	Letter SDG Narrative	,		
•	3.1	Is the Narrative or Cover Letter Present?	ГĄ		_
	3.2	Are Case Number and/or SAS number contained in the Narrative or Cover letter?	ग्त्र		
	3.3	Does the narrative contain the following information:			
*		VOA: description of trap and columns used during sample analyses?	Ų		
		BNA: description of columns used during sample analyses?	П		<u>/</u>
		Pest: description of columns used during sample analyses?	П		✓—
	NOTE:	As per section 6.23.3.1 SOW/p. D-11/Pest, Packed columns are not permitted.			_
	3.4	Does the narrative, VOA and BNA sections, contain a list of all TICs identified as alkanes and their estimated concentrations?		<u>*</u>	•
	3.5	Does the narrative contain a record of all cooler temperatures? If the temperature of a cooler was exceeded, > 10° C, the lab must list by fraction and sample number, all affected samples.		<u> </u>	<u>.</u>
	3.6	Does the narrative contain a list of the pH values determined for each water sample submitted for volatile analysis?	ப	<u> </u>	* - —
	3.7	Does the Case Narrative contain the statement, "verbatim", as required in Section B of the SOW?	7		. –
	ACTIO	ON: If "No", to any question in this section,			

contact the laboratory for all necessary resubmittals. If information is not available, document in the Data Assessment under Problems/Non-Compliance section.

* This information was found in the other section

US EPA Region II

Date: October 1995

Method: CLP/SOW OLMO3.1 SOP HW-6, Rev. 10 YES NO N/A 4.0 Data Validation Checklist Check the package for the following discrepancies: a. Is the package paginated in ascending order starting from the SDG narrative? b. Are all forms and copies legible? c. Is each fraction assembled in the order set forth in the SOW? d. Is a Sample Data Summary Package submitted immediately preceding the Sample Data Package? The following checklist is divided into three parts. Part A is for any VOA analyses, Part B is for BNAs and Part C is Pesticide/PCBs. Does this package contain: VOA Data? BNA Data?

ACTION: Complete corresponding parts of checklist.

Pesticide/PCB data?

US EPA Region II

Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

YES NO

PART A: VOA ANALYSES

1.0 Sample Conditions/Problems

1.1 Do the Traffic Reports/Chain-of-Custody Records, Sampling Report or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50% - 90% water, all data should be flagged as estimated "J". If a soil sample other than TCLP contains more than 90% water, all data should be qualified as unusable "R".

ACTION: If samples were not iced or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), then flag all positive results with a "J" and all non-detects "UJ".

ACTION: If both VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: The smallest soil size permitted is 0.5g. If any soil sample is smaller than 0.5g, document in the Data Assessment under Contract Problems/Non-Compliance.

2.0 Holding Times

2.1 Have any VOA technical holding times, determined from date of collection to date of analysis, been exceeded?

Technical Holding Times: If unpreserved, aqueous samples, maintained at 4° C for aromatic hydrocarbons analysis must be analyzed within 7 days of collection. If preserved with HCl (pH < 2) and stored at 4° C, then aqueous samples must be analyzed within 14 days of collection. If uncertain about preservation, contact sampler to determine whether or not samples were preserved. The holding time for soils is 10 days from date of collection.

Holding Time for Six Samples exceeded by one day in the reaminging

US EPA Region II

Method: CLP/SOW CLMO3.1

Date: October 199! SOP HW-6, Rev. 1

YES NO N/

Table of Holding Time Violations (See Chain-of-Custody Records)

Sample ID	Sample Matrix	Was Sample Preserved?	Date Sampled	Date Lab Received	Date Analyzed
Twibb Re	water	No .	4-4-98	4-7-98	4-12-28
Tw. bTRe	<u> </u>	· *	<u> </u>	>	<u> </u>
Tw/68 Re		,	F		
Tw169Ke	<u> </u>	<u> </u>	\$		
TW170 R1	4			<u> </u>	
TW 171 RC	<u> </u>	,			<u> </u>

The original Sample visuals with the guardier local and ACTION: If technical holding times are exceeded, flag all reported positive results as estimated "J" and sample on the quantitation limits as estimated "UJ", and document in the Data Assessment that holding

times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results must be qualified "J", but the reviewer may determine that non-detect data are unusable "R". If holding times are exceeded by more than 28 days, all non detect data are unusable "R".

NOTE: Contractual Holding Times: Analysis of water and soil/sediment samples must be completed within 10 days of Validated Time of Sample Receipt (VTSR). This requirement does not apply to Performance Evaluation (PE) samples.

ACTION: If contractual holding times are exceeded, document in the Data Assessment and on the Organic Regional Data Assessment Summary form.

NOTE: The data reviewer must note in the Data Assessment whether or not technical and contractual holding times were met.

US EPA Region II
Method: CLP/SOW OLMO3.3

Date: October 1995

Metl	ned: CLI	P/SOW OLMO3.1 SOP	HW-6	, Re	v. 1 — -
			YES	МО	
3.0	System	Monitoring Compound (SMC) Recovery (Form II)			
	3.1	Are the VOA SMC Recovery Summaries (Form II) present for each of the following matrices:			
		a. Low Water?	ग्र		. –
		b. Low Soil?	\Box		. –
		c. Med Soil?			. –
	3.2	Are all the VOA samples listed on the appropriate System Monitoring Compound Recovery Summary for each of the following matrices:			
		a. Low Water?	1त्र्		
		b. Low Soil?	\Box		<u> </u>
		c. Med Soil?			
	ACTIC	ON: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document effect in the Data Assessments.			
	3.3	Were outliers marked correctly with an asterisk?	Π		<u> </u>
	ACTIO	ON: Circle all outliers in red.			
	3.4	Was one or more VOA system monitoring compound recovery outside of contract specifications for any sample or method blank?		<u>يا ۽</u>	<u> </u>
-		If yes, were samples re-analyzed?			
		Were method blanks re-analyzed?			
	ACTI(ON: If recoveries are > 10%, but 1 or more compounds fail to meet SOW specifications:			
		 All positive results are qualified as estimated "J". 			
		2. Flag all non-detects as estimated detection limits "UJ" where recovery is less than the			

levels, do not qualify non-detects.

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lower acceptance limit.

3. If SMC recoveries are above allowable

US EPA Region II Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

YES NO N/A

If any system monitoring compound recovery is
< 10%:</pre>

- 1. Flag all positive results as estimated "J".
- 2. Flag all non-detects as unusable "R".

Professional judgement should be used to qualify data that only have method blank SMC recoveries out of specification in both original and re-analyses. Check the internal standard areas.

NOTE: Contractual requirements state that if any SMC fails the acceptance criteria, the sample must be re-analyzed. If the affected sample was not re-analyzed, document in the Data Assessment under Contract Problems/Non-Compliance.

NOTE: The laboratory must submit the following data:
1. If SMC recoveries and internal standard
responses meet the acceptance criteria in the reanalyzed sample, then the laboratory must submit
only the re-analysis.

2. If an SMC recovery and/or internal standard response fails to meet the acceptance criteria upon re-analysis, then submit data from both analyses.

(Refer to section 11.4.3.2, page D-46/VOA of the SOW for more information.)

3.5 Are there any transcription/calculation errors between raw data and Form II?

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and note errors in the Data Assessment.

4.0 Matrix Spikes (Form III)

4.1 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form (Form III) present?

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,	
٠V ,	
F Y 7	
1 1	
1 1	

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US EPA Region II Method: CLP/SOW OLMO3.1

Date: October 1995

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			YES	3	МО	
	4.2	Were matrix spikes analyzed at the required frequency for each of the following matrices:		ſ	-	
•		a. Low Water?	1	Ĺ		
		b. Low Soil?	L	L		
		c. Med Soil?	1	L		
	ACTIO	N: If any matrix spike data are missing, take the action specified in 3.2 above.			٠	
	4.3	How many VOA spike recoveries are outside QC limits?				
		Water 2x60 Soils				
		O				
	4.4	How many RPDs for matrix spike and matrix spike duplicate recoveries are outside QC limits?				
		Water 60 Soils				
		O_ out of 8Out of 5				
	ACTIO	N: No action is taken based upon MS/MSD data <u>alone</u> . However, using informed professional judgement, the MS/MSD results may be used in conjunction with other QC criteria to determine the need for qualification of the data.	3			
	ACTIO	N: Circle all outliers in red.				
5.0	Blanks	(Form IV)		/		
	5.1	Is the Method Blank Summary (Form IV) present?	Τ.	1		
	5.2	Frequency of Analysis: for the analysis of VOA TCL compounds, has a reagent/method blank been analyzed for each SDG or every 20 samples of similar matrix (low water, low soil or medium soil), whichever is more frequent?	T.	/		
	5.3	Has a VOA method blank been analyzed at least once every twelve hours for each concentration level and GC/MS system used2	۲,	/		-

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YES NO N/I

5.4 Was a VOA instrument blank analyzed after each sample/dilution which contained a target compound that exceeded the initial calibration range?

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5.5 Was a VOA storage blank analyzed at the end of all samples for each SDG in a case?

M __ _

ACTION: If any method/instrument blank data are missing, call lab for explanation or resubmittal. If method blank data are not available, reject "R" all associated positive data. However, using professional judgement, the data reviewer may substitute field blank or trip blank data for missing method blank data.

If any instrument blank analyzed after a sample with high concentration is missing, contact the lab for resubmittals. If the instrument blank was not analyzed or not available, inspect the chromatogram of the sample analyzed immediately after this analysis for possible carryover. Use professional judgement to determine if any contamination occurred and qualify analyte(s) accordingly.

If storage blank data is missing, contact the lab for the data. If unavailable, note in the Data Assessment under Contract Problems/Non-Compliance.

5.6 The validator should verify that the correct identification scheme for the EPA Blank samples were used. See page B-33, section 3.3.7.3 of the SOW for further information.

Was the correct identification scheme used for all VOA blanks?

<u>й —</u> -

ACTION: Contact the lab for resubmittals or make the required corrections on the forms. Document in the Data Assessment under Contract Problems/ Non-compliance if corrections were made by the validator.

5.7 Chromatography: review the blank raw datachromatograms (RICs), quant reports or data system printouts and spectra. Is the chromatographic performance (baseline stability) for each instrument acceptable for VOAs?

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YES



ACTION: Use professional judgement to determine the effect on the data.

Are all detected hits for target compounds in method and instrument blanks less than the CRQL for that analyte?

Exception: Acetone and 2-butanone must be less than 5 times the CRQL, and methylene chloride must be less than 2.5 times its CRQL.

ACTION: If yes, an explanation and laboratory's corrective actions must be addressed in the case narrative. If the narrative contains no explanation, then make note in the Data Assessment under Contract Problems/Non-Compliance.

6.0 Contamination

NOTE: "Water blanks", "drill blanks", and "distilled water blanks" are validated like any other sample, and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.

Do any method/instrument/reagent/storage blanks 6.1 √ <u>∟</u> have positive results (TCL and/or TIC) for VOAs?

NOTE: When applied as directed in the table below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for *moisture when necessary.

NOTE: A contaminated instrument blank is not allowable under this SOW. See page D-48/VOA, section 12.1.2.4 for additional information. Document in the Data Assessment under Contract Problems/Non-Compliance if contaminated instrument blank was submitted.

Do any field/trip/rinse blanks have positive VOA 6.2 results (TCL and/or TIC)?

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

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YES NO N/A

NOTE: All field blank results associated with a particular group of samples (may exceed one per case) must be used to qualify data. Trip blanks are used to qualify only those samples with which they were shipped and are not required for non-aqueous matrices. Blanks may not be qualified because of contamination in another blank. Field Blanks & Trip Blanks must be qualified for system monitoring compound, instrument performance criteria, spectral or calibration QC problems.

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks. If any blanks are grossly contaminated, all associated data should be qualified as unusable "R".

For:	Flag sample result with a "U" when:	Report CRQL & qualify "U" when:	No qualification is needed when:			
Methylene Chloride Acetone Toluene 2-Butanone	Sample conc. is > CRQL, but < 10x blank value.	Sample conc. is < CRQL and < 10x blank value.	Sample conc. is > CRQL and > 10x blank value.			
Other Conta- minants	Sample conc. is > CRQL, but < 5x blank value.	Sample conc. is < CRQL and < 5x blank value.	Sample conc. is > CRQL and > 5x blank value.			

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

ACTION: For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R".

6.3 Are there field/rinse/equipment blanks associated with every sample?

ACTION: For low level samples, note in the Data
Assessment that there is no associated
field/rinse/equipment blank. For samples with

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YES NO

high concentrations of suspected blank contaminants, use professional judgement to qualify these values and make a note in the

Exception: samples taken from a drinking water

7.0 GC/MS Instrument Performance Check (Form V)

Data Assessment.

7.1	Are	the	GC/MS	Ins	strum	nent	Performance	Chec	k Forms
	(For	cm V)	prese	ent	for	Bro	nofluorobenz	ene ((BFB)?

tap do not have associated field blanks.

7.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift?

7.3 Has an instrument performance check been analyzed for every analytical sequence on each instrument?

ACTION: List date, time, instrument ID, and sample analysis for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
			
		•	

ACTION: If lab cannot provide the missing data, reject "R" all data generated outside an acceptable twelve hour calibration interval.

7.4 Have the ion abundances been normalized to m/z 95?

ACTION: If mass assignment is in error, qualify all associated data as unusable "R".

7.5 Have the ion abundance criteria been met for each instrument used?

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

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		YES	МО	N/
ACTIO	N: If ion abundance criteria are not met, the Region II TPO must be notified.			
7.6	Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values, but if errors are found check more.)		प्	
7.7	Is the number of significant figures for the reported relative abundances consistent with the number given for each ion in the ion abundance criteria column?	ন্মে		
ACTION:	If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document any effects in the Data Assessments.		·	
7.8	Are the spectra of the mass calibration compound acceptable?	ι,		
ACTIO	N: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			
8.0 Target	Compound List (TCL) Analytes			
8.1	Are the Organic Analysis Data Sheets (Form I VOA) present with required header information on each page, for each of the following:			
	a. Samples and/or fractions as appropriate?	ग्त्र		_
	b. Matrix spikes and matrix spike duplicates?	<u>।</u> त्य		
	c. Blanks?	14		_
8.2	Are the VOA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following:			
	a. Samples and/or fractions as appropriate?	14		
	b. Matrix spikes and matrix spike duplicates (mass spectra not required)?	[]		_
	c. Blanks?	1/1		

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			YES	NO	
	ACTION	: If any data are missing, take action specified in 3.2 above.			
•		Are the response factors shown in the Quant Report?	प्त		
	8.4	Is chromatographic performance acceptable with respect to:	/		
\$		a. Baseline stability?	त् य		. <u>-</u>
		b. Resolution?	न्त्र		.
		c. Peak shape?	13		
		d. Full-scale graph (attenuation)?	12		
		e. Other:?	11		
	ACTION	I: Use professional judgement to determine the acceptability of the data.			
	8.5	Are the lab-generated standard mass spectra of the identified VOA compounds present for each sample?	īΛį		_
	ACTION	N: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate its own standard spectra, document in the Data Assessment in the Contract Non-compliance section and the Organic Regional Data Assessment Summary.			
	8.6	Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	ιγī	·	. —
	8.7	Are all ions present in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?	1/1		
	8.8	Do sample and standard relative ion intensities agree within ±20%?	<u>'\</u>		
	ACTIO	N: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected "R", flagged "N" (presumptive evidence of the presence of the compound) or changed to not detected "U" at the			•

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> YES NO N/I

calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 8.6, 8.7, and 8.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

9.0 Te

<u>entati</u>	vely Identified Compounds (TIC)			
9.1	Are all Tentatively Identified Compound Forms (Form I Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?	त्त्	_	_
9.2	Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:			
	a. Samples and/or fractions as appropriate?	त्र		_
	b. Blanks?	<u> </u>		- ,
	c. Alkanes listed for each sample?	\Box		_
ACTIO	N: If any TIC data are missing, take action specified in 3.2 above.			
ACTIO	N: Add "N" qualifier to all chemically named TICs, if missing.			
9.3	Are any TCL compounds (from any fraction) listed as TIC compounds? (Example: 1,2- dimethylbenzene is xylene, a VOA TCL analyte, and should not be reported as a TIC.)		ų	_
ACTIO:	N: Flag with "R" any TCL compound listed as a TIC.			
9.4	Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?	π,		_
9.5	Do TIC and "best match" standard relative ion intensities agree within $\pm 20\%$?	<u> </u>	· .	_
ACTIO	N: Use professional judgement to determine the			

acceptability of TIC identifications. If it is

determined an incorrect identification was

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YES NO

made, change the identification to "unknown,"
or to some less specific identification as
appropriate. (Example: "C3 substituted
benzene.")

Also, when a compound is not found in any blank, but is detected in a sample and is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable "R". (E.g., Common Lab Contaminants: CO₂ (M/E 44), siloxanes (M/E 73) hexane, aldol condensation products, solvent preservatives, and related by-products - see Functional Guidelines for more guidance.)

9.6 Are TICs with responses < 10% of the internal standard (as determined by inspection of the peak areas or height) reported?

ACTION: If yes, cross out questionable TIC(s).

10.0 Compound Quantitation and Reported Detection Limits

- 10.1 Are there any transcription/calculation errors in Form I results? (Check at least two positive values. Verify that the correct internal standards, quantitation ions, and RRF were used to calculate Form I results.)
- 10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?

ACTION: If errors are large, call the lab for explanation/resubmittals, make any necessary corrections, and note errors under Contract Problems/Non-Compliance section of the Data Assessment and the Organic Regional Data Assessment Summary.

ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its associated value on the original Form I and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form Is

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> YES NO N/i

that should not be used, including any in the summary package.

11.0 Standards Data (GC/MS)

11.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant. Reports) present for initial and continuing calibration?

[4

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

12.0 GC/MS Initial Calibration (Form VI)

12.1 Are the Initial Calibration Forms (Form VI) present and complete at concentrations of 10, 20, .50, 100, 200ng for separate calibrations of low water/med soils (unheated purge) and low soils (heated purge)?

ACTION: If any calibration standard forms are missing, take action specified in 3.2 above.

Were all low level soil standards, blanks and samples analyzed by heated purge?

[·]

ACTION: If low level soil samples were not heated during purge, qualify positive hits "J" (estimated) and non-detects "R".

12.3 Are the % relative standard deviation (%RSD) values for VOAs ≤ 30% over the concentration range of the calibration?

ACTION: Circle all outliers in red.

NOTE: Although 11 VOA compounds have a minimum RRF and no maximum %RSD, the technical criteria are the same for all analytes.

ACTION: If %RSD is > 30.0%, qualify associated positive results for that analyte "J" and non-detects using professional judgement. When %RSD is > 90%, flag all non-detects for that analyte "R" (unusable) and positive hits "J" (estimated).

NOTE: Analytes previously qualified "U" for blank contamination are still considered as "hits" when qualifying for initial calibration criteria.

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ethe	d: CLP	/SOW OLMO3.1	SOP	HW-6,	Res
				YES	NO
	12.4	Are any average RRFs < 0.05?			П
	Action	: Circle all outliers in red.			
	Action	a: If the average RRF is < 0.05, then qualify associated non-detects with an "R" and flag associated positive data as estimated "J".			-
	12.5	Are there any transcription/calculation errors the reporting of average relative response factors (RRF) or %RSD? (Check at least 2 value but if errors are found, check more.)			īĄ
	NOTE:	The SOW allows up to two of the <u>required</u> analyte to fail %RSD or RRF criteria, provided that the %RSD is ≤ 40% and the RRF is ≥ 0.010. (See Table 5, page D-59/VOA or analytes marked with a "." Form VI for required analytes.)	le .e		
	ACTION	N: If more than two analytes failed %RSD or RRF criteria, document in the Data Assessment und Contract Problems/Non-Compliance and the Organic Regional Data Assessment Summary.	ler		
.3.0	GC/MS	Continuing Calibration (Form VII)			
	13.1	Are the Continuing Calibration Forms (Form VII) present and complete for separate calibration clow water/med soil and low soil samples?		17	
	13.2	Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?		ग्त	
	ACTIO	N: If any forms are missing or no continuing calibration standard has been analyzed within twelve hours of every sample analysis, call for explanation or resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable "R".	lab		
	ACTIO:	N: List below all sample(s) that were not analy within twelve hours of the previous continuicalibration.			

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YES NO N/.

13.3 Do any volatile compounds have a percent difference (%D) between the initial and continuing RRF which exceeds the ±25% criteria?

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ACTION: Circle all outliers in red.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated. When %D is > 90%, qualify all non-detects for that analyte "R" (unusable) and positive results "J" (estimated).

13.4 Are any continuing calibration RRFs < 0.05?

ACTION: Circle all outliers in red.

ACTION: If the RRF is < 0.05, qualify the associated non-detects as unusable "R" and the associated positive values "J".

NOTE: The SOW allows up to two of the required analytes to fail %D and RRF criteria, provided that the %D is ≤ 40% and the RRF is ≥ 0.010. (See Table 5 pg. D-59/VOA or analytes marked with a "*" on Form VI for required analytes.)

ACTION: If more than two analytes failed %D and RRF, criteria document in the Data Assessment under contract Problems/Non-Compliance and on the Organic Regional Data Assessment Summary form.

13.5 Are there any transcription/calculation errors in the reporting of RRF or %D between initial and continuing RRFs? (Check at least two values, but if errors are found, check more.)

_ <u>_</u> _

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document in the Data Assessment under the Contract Problems/Non-Compliance section and the Organic Regional Data Assessment Summary.

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14.0 Internal Standard (Form VIII)

. 14.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to +100%) for each continuing calibration?

If no, was the sample re-analyzed?

ACTION: 1. Circle all outliers in red.

2. List all the outliers below.

Sample #	Internal Std.	Area	Lower/Upper	Limit
				/
		-		/
				/

(Attach additional sheets if necessary.) (or attach copies of Form VIIIs)

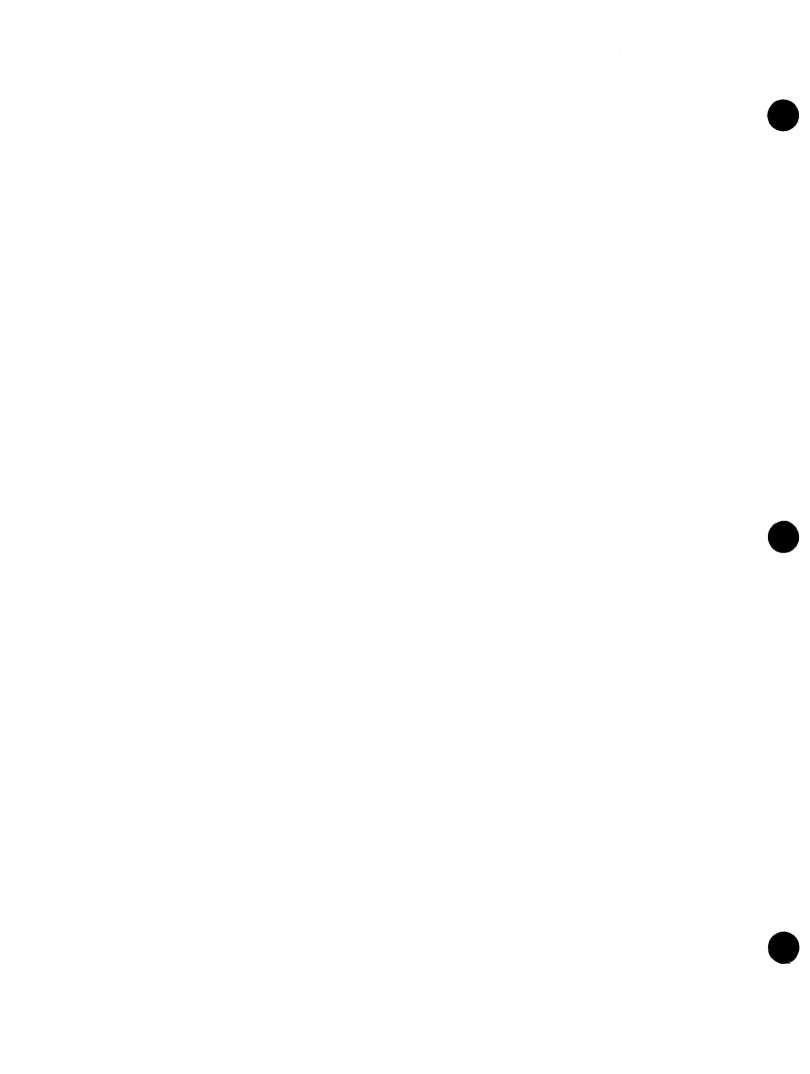
ACTION: If any sample was not re-analyzed, document in the Data Assessment under Contract Problems/Non-Compliance.

ACTION: 1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

- 2. Non-detects associated with IS area counts > 100% should not be qualified.
- 3. If the IS area in the sample is below the "lower limit," < 50%, qualify all analytes associated with that IS estimated, "J". If the area counts are extremely low, < 25% of the area in the 12 hour standard, or if performance exhibits a major abrupt drop- off, flag all associated non-detects as unusable, "R", and positive hits estimated, "J".
- Are the retention times of the internal standards within 30 seconds of the associated calibration standard?

	4	
V		

REFERENCE NO. 13





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908-225-6116 • Fax 908-225-7037

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM EPA CONTRACT 68-W5-0019

DATA QUALITY OBJECTIVE

DOCUMENT CONTROL NO.: START-02-F-01788 SMITH TOWN, LONG ISLAND PROJECT NO.: 2500 SDG NO.: E0476

REPORTED BY ROY F. WESTON, INC.

REVIEVED BY:

Zohreh Hamid, Ph.D. Senior Chemist

Date

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SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM EPA CONTRACT 68-W5-0019

SITE NAME: SMITH TOWN, LONG ISLAND PROJECT NUMBER: 2500 DCN # START-02-F-01788 SDG NUMBER: E0476

DISCUSSION

Forty-seven water samples including one trip blank and one field duplicate were collected on 04-05-98. Mitkem Corporation Laboratory located in Warwick, Rhode Island received the samples in good condition on 04-07-98. The samples were analyzed based on EPA Method 524.2 for specific volatile target compounds.

Based on the chain-of-custody records, the following samples were encountered in this data package:

TB03	TW31	TW177	TW251	TW261
TW22	TW32	TW178	TW252	TW262
TW23	TW33	TW179	TW253	TW263
TW24	TW34	TW180	TW254	TW264
TW25	TW35	TW181	TW255	TW265
TW26	TW172	TW182	TW256	TW266
TW27	TW173	TW183	TW257	TW37
TW28	TW174	TW184	TW258	
TW29	TW175	TW36	TW259	
TW30	TW176	TW250	TW260	

The analysis data have been evaluated according to the USEPA Region II Functional Guidelines and the Quality Control criteria set forth in the applied Method based on the following parameters:

- Holding Time
- Calibration Analysis
- Blank Analysis
- Matrix Spike/Spike Duplicate (MS/MSD)
- Laboratory Control Sample Results
- Field Duplicate
- Instrument Performance
- Surrogate Recovery
- Internal Standard Recovery
- Compound Identification/Quantitation
- Data Package Completeness

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Holding Time

These water samples were prepared and analyzed according to the criteria set forth in the USEPA Method 524.2 for specific volatile target compounds. The samples were collected on 04-05-98 and analyzed on 04-07,08,09,11,12-98, within the 7-day analysis holding time.

Calibration

A five point initial calibration and continuing calibration analysis were included in this data package. The %RSDs, %Ds, and response factors were within the control limits, with the exception of the response factors for 1,2-dibromo-3-chloropropane, which were below 0.05 in all initial and continuing calibrations. This compound was not detected in the samples. The non-detected values were rejected.

Blank Analysis

The laboratory blanks were free of target compounds. However, the trip blank had chloroform (13 ug/L) and naphthalene (0.6 ug/L) contamination. The reported sample results up to the action levels (5x the blank contamination) were qualified "U" and should be considered as non-detected values. The laboratory blank and trip blank had unknown target compounds as Tentatively Identified Compounds (TICs). The reported sample results were rejected in the samples.

Matrix Spike/Spike Duplicate Analysis

One set of matrix spike/spike duplicate analyses was performed on sample TW37. The sample was spiked with all requested target compounds. The recoveries and RPDs of the spiked compounds were within the range of 70-130% and 20%, established by the laboratory with the exception of the following:

COMPOUND NAME	MS/MSD	% RECOVERY	RPD
Isopropylbenzene	MSD	21	
4-Isopropyltoluene	MSD	21	
1,2,4-Trichlorobenzene	MSD	60	27
Hexachlorobutadiene	MSD	65	24
1,2,3-Trichlorobenzene	MSD	50	37
Naphthalene	MSD	53	28



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The data were not impacted, since the recoveries were within the control limits in the matrix spike sample. Also, the above compounds were not detected in the samples with the exception of naphthalene. The data were not qualified based on these outliers, since the results for naphthalene have been qualified due to the trip blank contamination.

Laboratory Control Sample

Five laboratory control spike samples were analyzed with this batch. The recoveries were within the control limits, with the exception of the following:

BLANK ID	COMPOUND ID	% RECOVERY
VBLK2I	n-Butylbenzene	125
VBLK2K	Methylene Chloride	125

These target compounds were not detected in the samples; therefore, the data were not impacted.

Instrument Performance

The samples were analyzed within the 12 hours from tunning. The ion abundance ratios for the BFB check standard were within the control limits.

Surrogate Recovery

Samples were spiked with the two surrogate compounds (bromofluorobenzene and 1,2-dichlorobenzene). The recoveries were within the 80-120% control limits established by the laboratory.

Internal Standard Analysis

The samples were spiked with two internal standards prior to the sample analysis. The comparison of the sample area with the corresponding daily calibration analysis demonstrated that the recoveries and the retention times of the internal standards were within the requirement limits

Duplicate Analysis

Sample TW35 is a field duplicate of sample TW34. The RPDs for the detected target compounds were within 20%.



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Compound Quantitation/Identification

All samples, with the exception of sample TW25, were analyzed at one-fold dilutions. Sample TW25 was reanalyzed at a five-fold dilution, due to the high concentration of cis-1,2-dichloroethene. The result from the reanalysis sample was transferred to the original sample data and should be used by the data user.

Tentatively Identified Compounds (TICs) were detected in the samples. The results were rejected, since this unknown compound was detected in the trip blank and the laboratory blank.

The reported data for 1,1,1-trichloroethane was qualified estimated, since their mass spectra did not match the reference standard spectrum. Also, the result for dichlorodifluoromethane in sample TW251 was qualified estimated, due to the column analysis problem.

The results below the CRQL were qualified estimated due to the uncertainty near the detection limits

Data package Completeness

The data Package completeness is satisfactory. The cooler temperature was with in the control limits. The major problems were not encountered during the analysis. The minor issues were discussed. The data were accepted with the applied qualifier codes.



- 1. Appendix A- Glossary of Data Qualifier
- 2. Appendix B- Data Summary Forms
- 3. Appendix C- Laboratory Results
- 4. Appendix D- Region II Work Sheet
- 5. Appendix E Support Documentation



Appendix A Glossary of Data Qualifier



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SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM EPA CONTRACT 68-W5-0019

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

- NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

 [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2- butanone in the VOA analyses, and common phthalates in the BNA analyses, along with tentatively identified compounds) or less than 5 times the blank level for other target compounds.]
- W = UNUSABLE RESULT. THE PRESENCE OR ABSENCE OF THIS ANALYTE CANNOT BE VERIFIED. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.
- N = NEGATED COMPOUND. THERE IS PRESUMPTIVE EVIDENCE TO MAKE A TENTATIVE IDENTIFICCATION.

CODES RELATING TO QUATITATION

(can be used for both positive results and sample quantitation limits):

- J = ANALYTE WAS POSITIVELY IDENTIFIED. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.
- UJ = ANALYTE WAS NOT DETECTED. THE REPORTED QUATITATION LIMIT IS QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

000008





Appendix B Data Summary Forms

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0478

	CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TB03 E0476-01 WATER 1.0 ug/L	TW22 E0476-02 WATER 1.0 ug/L	TW23 E0476-03 WATER 1.0 ug/L	TW24 E0476-04 WATER 1.0 ug/L	TW25DL E0476-05 WATER 1/5.0 * ug/L	TW26 E0476-06 WATER 1.0 ug/L	TW27 E0476-07 WATER 1.0 ug/L
	TARGET COMPOUNDS:						•		
		Reporting							
		Limit							
	Dichlorodifluoromethane	0.5							
	Chloromethane	0.5							
	Vinyl Chloride	0.5							
	Bromomethane	0.5							
	Chloroethane	0.5							
	Trichlorofluoromethane	0.5							•
	1,1-Dichloroethene	0.5							3.2
	Methylene Chloride	0.5							
	trans-1,2-Dichloroethene	0.5		4.4		0.07	0.5		
	Methyl tert-butyl ether	0.5		1.1	4	0.87	0.59		
	1,1-Dichloroethane	0.5			1 1.2		0.59 110 *		
	Cis-1,2-Dichiolocularie	0.5			1.2		110		
	2,2-Dichloropropane 1,2-Dichloroethane	0.5 0.5							
نسا	Bromochloromethane	0.5 0.5							
	Chloroform	0.5 0.5	13						0.79 U
	Carbon Tetrachloride	0.5	13					•	0.19 0
	1,1,1-Trichloroethane	0.5			0.96 J	1 J	0.93 J		17 J
	1,1-Dichloropropene	0.5			0.55	, •	0.55 0		17.0
	Trichloroethene	0.5					1.9		
	1,2-Dichloropropane	0.5							
	Benzene	0.5							
	Dibromomethane	0.5							
	Bromodichloromethane	0.5							
	cis-1,3-Dichloropropene	0.5							
	Toluene	0.5							
	Trans-1,3-Dichloropropene	0.5							
	1,1,2-Trichloroethane	0.5							
	Tetrachloroethene	0.5			1.9		14		
	1,3-Dichloropropane	0.5							
	Dibromochloromethane	0.5							
	1,2-Dibromoethane	0.5							
	Chlorobenzene	0.5							,
	1,1,2,2-Tetrachloroethane	0.5							
	Ethylbenzene	0.5				•			•
	m,p-Xylene	0.5						•	

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TB03 E0476-01 WATER 1.0 ug/L	TW22 E0476-02 WATER 1.0 ug/L	TW23 E0476-03 WATER 1.0 ug/L	TW24 E0476-04 WATER 1.0 ug/L	TW25DL E0476-05 WATER 1/5.0 * ug/L	TW26 E0476-06 WATER 1.0 ug/L	TW27 E0476-07 WATER 1.0 ug/L
TARGET COMPOUNDS:								
	Reporting							
	Limit							
o-Xylene	0.5							
Styrene	0.5							
Bromoform	0.5							
Isopropylbenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Bromobenzene	0.5							
1,2,3-Trichloropropane	0.5							
n-Propylbenzene	0.5							
2-Chlorotoluene	0.5							
1,3,5-Trimethylbenzene	0.5							
4-Chlorotoluene	0.5			,				
tert-Butylbenzene	0.5							
1,2,4-Trimethylbenzene	0.5							
sec-Butlybenzene	0.5							
1,3-Dichlorobenzene	0.5							•
4-Isopropyltoluene	0.5							
1,4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5							
1,2-Dichlorobenzene	0.5							
1,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	R
1,2,4-Trichlorobenzene	0.5							
Hexachlorobutadiene	0.5							
Naphthalene	0.5	0.6						
1,2,3-Trichlorobenzene	0.5							

Remarks:
* Report from 5 fold dilution

Trip Blank

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS	TW28 E0476-08 WATER 1.0 ug/L	TW29 E0476-09 WATER 1.0 ug/L	TW30 E0476-10 WATER 1.0 ug/L	TW31 E0476-11 WATER 1.0 ug/L	TW32 E0476-12 WATER 1.0 ug/L	TW33 E0476-13 WATER 1.0 ug/L	TW34 E0476-14 WATER 1.0 ug/L
TARGET COMPOUNDS:							
	Reporting Limit						
Dichlorodifluoromethane	0.5						
Chloromethane	0.5			•			
Vinyl Chloride	0.5						
Bromomethane	0.5		•				
Chloroethane	0.5						
Trichlorofluoromethane	0.5						
1,1-Dichloroethene	0.5						
Methylene Chloride	0.5						
trans-1,2-Dichloroethene	0.5 0.5						0.58
Methyl tert-butyl ether 1,1-Dichloroethane	0.5 0.5		•				0.50
cis-1,2-Dichloroethane	0.5						
2,2-Dichloropropane	0.5						
1,2-Dichloroethane	0.5						
Bromochloromethane	0.5						
Chloroform	0.5			0.94 U			
Carbon Tetrachloride	0.5						
1,1,1-Trichloroethane	0.5						2.4 J
1,1-Dichloropropene	0.5					•	
Trichloroethene	0.5 0.5						
1,2-Dichloropropane Benzene	0.5						
Dibromomethane	0.5						
Bromodichloromethane	0.5						
cis-1,3-Dichloropropene	0.5						
Toluene	0.5						4
Trans-1,3-Dichloropropene	0.5						
1,1,2-Trichloroethane	0.5	1					
Tetrachloroethene	0.5						
1,3-Dichloropropane	0.5						
Dibromochloromethane	0.5						
1,2-Dibromoethane Chlorobenzene	0.5 0.5						
1,1,2,2-Tetrachioroethane	0.5 0.5		•			•	
Ethylbenzene	0.5						
m,p-Xylene	0.5						

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS	TW28 E0476-08 WATER 1.0 ug/L	TW29 E0476-09 WATER 1.0 ug/L	TW30 E0476-10 WATER 1.0 ug/L	TW31 E0476-11 WATER 1.0 ug/L	TW32 E0476-12 WATER 1.0 ug/L	TW33 E0476-13 WATER 1.0 ug/L	TW34 E0476-14 WATER 1.0 ug/L
TARGET COMPOUNDS:							*************
	Reporting						
	Limit						
o-Xylene	0.5						
Styrene	0.5						
Bromoform	0.5						
sopropylbenzene	0.5						
,1,2,2-Tetrachloroethane	0.5						
Bromobenzene	0.5						
,2,3-Trichloropropane	0.5		·				
-Propylbenzene	0.5						
?-Chlorotoluene	0.5						
,3,5-Trimethylbenzene	0.5						
l-Chlorotoluene	0.5						
ert-Butylbenzene	0.5						
,2,4-Trimethylbenzene	0.5						
ec-Butlybenzene	0.5		•				
,3-Dichlorobenzene	0.5						
-Isopropyltoluene	0.5						
,4-Dichlorobenzene	0.5						
-Butlybenzene	0.5						•
,2-Dichlorobenzene	0.5						
,2-Dibromo-3-chloropropane	0.5 F	R R	R	R	R	R	
,2,4-Trichlorobenzene	0.5						
łexachlorobutadiene	0.5		•			•	
laphthalene	0.5						
1,2,3-Trichlorobenzene	0.5						

Remarks:

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0478

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS	E04 W/	W35 476-15 ATER 1.0 ug/L	TW172 E0476-16 WATER 1.0 ug/L	TW173 E0476-17 WATER 1.0 .ug/L	TW174 E0476-18 WATER 1.0 ug/L	TW175 E0476-19 WATER 1.0 ug/L	TW176 E0476-20 WATER 1.0 ug/L	TW177 E0476-21 WATER 1.0 ug/L
TARGET COMPOUNDS:								
•	Reporting Limit							
Dichlorodifluoromethane	0.5							
Chloromethane	0.5							

TARGET COMPOUNDS:						
·	Reporting					
	Limit					
Dichlorodifluoromethane	0.5					
Chloromethane	0.5					
Vinyl Chloride	0.5					
Bromomethane	0.5					
Chloroethane	0.5					
Trichlorofluoromethane	0.5					
1,1-Dichloroethene	0.5					
Methylene Chloride	0.5					
trans-1,2-Dichloroethene	0.5					
Methyl tert-butyl ether	0.5	0.6				
1,1-Dichloroethane	0.5					
cis-1,2-Dichloroethane	0.5					
2,2-Dichloropropane	0.5					
1,2-Dichloroethane	0.5					
Bromochloromethane	0.5					
Chloroform	0.5					
Carbon Tetrachloride	0.5					
1,1,1-Trichloroethane	0.5	2.4 J	0.57 J	0.62 J	0.58 J	0.63 J
1,1-Dichloropropene	0.5 0.5	2.4 0	0.07 0	0.02 0	0.00 0	0.00 0
Trichloroethene	0.5 0.5					
1,2-Dichloropropane	0.5 0.5					
Benzene	0.5 0.5				•	
Dibromomethane	0.5 0.5					
Bromodichloromethane	0.5					
cis-1,3-Dichloropropene	0.5					
Toluene	0.5					
Trans-1,3-Dichloropropene	0.5					
1,1,2-Trichloroethane	0.5				7.7	
Tetrachloroethene	0.5				1.1	
1,3-Dichloropropane	0.5					
Dibromochloromethane	0.5					
1,2-Dibromoethane	0.5					
Chlorobenzene	0.5					
1,1,2,2-Tetrachloroethane	0.5					
Ethylbenzene	0.5				•	
m,p-Xylene	0.5					

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW35 E0476-15 WATER 1.0 ug/L	TW172 E0476-16 WATER 1.0 ug/L	TW173 E0476-17 WATER 1.0 ug/L	TW174 E0476-18 WATER 1.0 ug/L	TW175 E0476-19 WATER 1.0 ug/L	TW176 E0476-20 WATER 1.0 ug/L	TW177 E0476-21 WATER 1.0 ug/L
TARGET COMPOUNDS:								
ARGEI COMPOUNDS.	Reporting							
	Limit						,	
o-Xylene	0.5						•	
Styrene	0.5							
Bromoform	0.5							
sopropylbenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Bromobenzene	0.5							
1,2,3-Trichloropropane	0.5							
n-Propylbenzene	0.5							
2-Chlorotoluene	0.5							
1,3,5-Trimethylbenzene	0.5							
4-Chlorotoluene	0.5							
ert-Butylbenzene	0.5							
1,2,4-Trimethylbenzene	0.5							
sec-Butlybenzene	0.5							•
1,3-Dichlorobenzene	0.5		*					•
4-isopropyitoluene	0.5							
1,4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5							
1,2-Dichlorobenzene	0.5							
1,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	R
I,2,4-Trichlorobenzene	0.5							
-lexachlorobutadiene	0.5							
Naphthalene	0.5							
1,2,3-Trichlorobenzene	0.5							

Remarks:

Field Duplicate

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0478

CLIENT SAMPLE ID:	TW178	TW179	TW180	TW181	TW182	TW183	TW184
LAB SAMPLE ID:	E0476-22	E0476-23	E0476-24	E0476-25	E0476-26	E0476-27	E0476-28
MATRIX:	WATER						
DILUTION FACTOR:	1.0	1.0	1.0	1.0	1.0	1.0	1.0
UNITS	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	u g/ L
FARGET COMPOUNDS:	porting						

TARGET COMPOUNDS:	
	Reporting
	Limit
Dichlorodifluoromethane	0.5
Chloromethane	0.5
Vinyl Chloride	0.5
Bromomethane	0.5
Chloroethane	0.5
Trichlorofluoromethane	0.5
1,1-Dichloroethene	0.5
Methylene Chloride	0.5
trans-1,2-Dichloroethene	0.5
Methyl tert-butyl ether	0.5
1,1-Dichloroethane	0.5
cis-1,2-Dichloroethane	0.5
2,2-Dichloropropane	0.5
1,2-Dichloroethane	0.5
Bromochloromethane	0.5
Chloroform	0.5
Carbon Tetrachloride	0.5
1,1,1-Trichloroethane	0.5
1,1-Dichloropropene	0.5
Trichloroethene	0.5
1,2-Dichloropropane	0.5
Benzene	0.5
Dibromomethane	0.5
Bromodichloromethane	0.5
cis-1,3-Dichloropropene	0.5
Toluene	0.5
Trans-1,3-Dichloropropene	0.5
1.1.2-Trichloroethane	0.5
Tetrachloroethene	0.5
1,3-Dichloropropane	0.5
Dibromochloromethane	0.5
1.2-Dibromoethane	0.5
Chlorobenzene	0.5
1,1,2,2-Tetrachloroethane	0.5
Ethylbenzene	0.5
m,p-Xylene	0.5
••	

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW178 E0476-22 WATER 1.0 ug/L	TW179 E0476-23 WATER 1.0 ug/L	TW180 E0476-24 WATER 1.0 ug/L	TW181 E0476-25 WATER 1.0 ug/L	TW182 E0476-26 WATER 1.0 ug/L	TW183 E0476-27 WATER 1.0 ug/L	TW184 E0476-28 WATER 1.0 ug/L
TABORT COMBOUNDS.			7.1	·				<u> </u>
TARGET COMPOUNDS:	Denorting							
	Reporting Limit					•		
o-Xylene	0.5							
Styrene	0.5							
Bromoform	0.5							
sopropylbenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Bromobenzene	0.5							
1,2,3-Trichloropropane	0.5							
n-Propylbenzene	0.5							
2-Chlorotoluene	0.5							
I,3,5-Trimethylbenzene	0.5							
4-Chlorotoluene	0.5							
ert-Butylbenzene	0.5							
1,2,4-Trimethylbenzene	0.5							
sec-Butlybenzene	0.5							
1,3-Dichlorobenzene	0.5							•
1-isopropyltoluene	0.5							
1,4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5							
,2-Dichlorobenzene	0.5							
,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	F
,2,4-Trichlorobenzene	0.5							
lexachlorobutadiene	0.5						•	
Naphthalene	0.5							
1,2,3-Trichlorobenzene	0.5							

Remarks:

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS	TW36 E0476-29 WATER 1.0 ug/L	TW250 E0476-30 WATER 1.0 ug/L	TW251 E0476-31 WATER 1.0 ug/L	TW252 E0476-32 WATER 1.0 ug/L	TW253 E0476-33 WATER 1.0 ug/L	TW254 E0476-34 WATER 1.0 ug/L	TW255 E0476-35 WATER 1.0 ug/L
TARGET COMPOUNDS:							. *************************************
HARGEI COMPOUNDS.	Reporting						
	Limit						
Dichlorodifluoromethane	0.5		4.2 J				
Chloromethane	0.5						
Vinyl Chloride	0.5				•		
Bromomethane	0.5						
Chloroethane	0.5						
Trichlorofluoromethane	0.5		0.94				
1.1-Dichloroethene	0.5		1.1				
Methylene Chloride	0.5	•					
trans-1,2-Dichloroethene	0.5						
Methyl tert-butyl ether	0.5						
1.1-Dichloroethane	0.5		2.6				
cis-1,2-Dichloroethane	0.5		3.5			1	
2,2-Dichloropropane	0.5						
1,2-Dichloroethane	0.5						
Bromochloromethane	0.5						
Chloroform	0.5						
Carbon Tetrachloride	0.5						
1,1,1-Trichloroethane	0.5		3.7 J			1.3 J	0.88 J
fl,1-Dichloropropene	0.5						
Trichloroethene	0.5		1			*	
1,2-Dichloropropane	0.5						
Benzene	0.5						
Dibromomethane	0.5						
Bromodichloromethane	0.5						
cis-1,3-Dichloropropene	0.5						
Toluene	0.5						
Trans-1,3-Dichloropropene	0.5						
fl.1,2-Trichlomethane	0.5						
Tetrachloroethene	0.5	,	12			7	3.8
fl,3-Dichloropropane	0.5						
Dibromochloromethane	0.5						
1,2-Dibromoethane	0.5						•
Chlorobenzene	0.5						
1,1,2,2-Tetrachloroethane	0.5					•	
Ethylbenzene	0.5						
m,p-Xylene	0.5						

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR:	E0 W	W36 476-29 ATER 1.0	TW250 E0476-30 WATER 1.0	TW251 E0476-31 WATER 1.0	TW252 E0476-32 WATER 1.0	TW253 E0476-33 WATER 1.0	TW254 E0476-34 WATER 1.0	TW255 E0476-35 WATER 1.0
UNITS		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
TARGET COMPOUNDS:								
	Reporting							
	Limit							
o-Xylene	0.5							
Styrene	0.5							
Bromoform	0.5							
Isopropylbenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Bromobenzene	0.5							
1,2,3-Trichloropropane	0.5							
n-Propylbenzene	0.5							
2-Chlorotoluene	0.5							
1,3,5-Trimethylbenzene	0.5			•				
4-Chlorotoluene	0.5							
ert-Butylbenzene	0.5							
1,2,4-Trimethylbenzene	0.5							
sec-Butlybenzene	0.5							
1,3-Dichlorobenzene	0.5							•
4-Isopropyltoluene	0.5							
1.4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5					•		
1.2-Dichlorobenzene	0.5							
1,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	R
1.2.4-Trichlorobenzene	0.5		11	13	,,		•	•
lexachlorobutadiene	0.5			•		•	•	
Naphthalene	0.5				1.5 U			
1,2,3-Trichlorobenzene	0.5				,.00			

Remarks:

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0478

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW256 E0476-36 WATER 1.0 ug/L	TW257 E0476-37 WATER 1.0 ug/L	TW258 E0476-38 WATER 1.0 ug/L	TW259 E0476-39 WATER 1.0 ug/L	TW260 E0476-40 WATER 1.0 ug/L	TW261 E0476-41 WATER 1.0 ug/L	TW262 E0476-42 WATER 1.0 ug/L
TARGET COMPOUNDS:			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
	Reporting							
•	Limit							
Dichlorodifluoromethane	0.5							
Chloromethane	0.5							
Vinyl Chloride	0.5							
Bromomethane	0.5							
Chloroethane	0.5							
Trichlorofluoromethane	0.5 0.5							
1,1-Dichloroethene	0.5 0.5							
Methylene Chloride trans-1,2-Dichloroethene	0.5 0.5							
Methyl tert-butyl ether	0.5							
1,1-Dichloroethane	0.5	0.93				0.51	0.65	
cis-1,2-Dichloroethane	0.5	0.00					0.93	
2,2-Dichloropropane	0.5							
1,2-Dichloroethane	0.5							
Bromochloromethane	0.5							
Chloroform	0.5							
Carbon Tetrachloride	0.5							
1,1,1-Trichloroethane	0.5	1.7 J				1.4 J	1.3 J	0.93 J
1,1-Dichloropropene	0.5							
Trichloroethene	0.5	0.52					0.54	0.89
1,2-Dichloropropane	0.5							
Benzene	0.5							
Dibromomethane	0.5							
Bromodichloromethane	0.5							
cis-1,3-Dichloropropene	0.5							
Toluene	0.5							
Trans-1,3-Dichloropropene	0.5 0.5							
1,1,2-Trichloroethane Tetrachloroethene	0.5 0.5						1.8	
1,3-Dichloroetnene	0.5 0.5						1.0	
Dibromochloromethane	0.5 0.5							
1,2-Dibromoethane	0.5 0.5							
Chlorobenzene	0.5							
1,1,2,2-Tetrachloroethane	0.5							
Ethylbenzene	0.5							
m,p-Xylene	0.5							

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: TW256 TW257 TW258 TW259 TW260 TW261 TW262 LAB SAMPLE ID: E0476-39 E0476-40 E0476-41 E0476-42 E0476-36 E0476-37 E0476-38 WATER MATRIX: WATER WATER WATER WATER WATER WATER **DILUTION FACTOR:** 1.0 1.0 1.0 1.0 1.0 1.0 1.0 ug/L UNITS ug/L ug/L ug/L ug/L ug/L ug/L

TARGET COMPOUNDS:								
	Reporting	•						
	Limit							
o-Xylene	0.5							
Styrene	0.5							
Bromoform	0.5							
Isopropylbenzene	0.5				-			
1,1,2,2-Tetrachloroethane	0.5							
Bromobenzene	0.5							
1,2,3-Trichloropropane	0.5							
n-Propylbenzene	0.5							
2-Chlorotoluene	0.5							
1,3,5-Trimethylbenzene	0.5							
4-Chlorotoluene	0.5							
ert-Butylbenzene	0.5							
1,2,4-Trimethylbenzene	0.5							
sec-Butlybenzene	0.5						•	
1,3-Dichlorobenzene	0.5						•	
4-Isopropyltoluene	0.5							
1,4-Dichlorobenzene	0.5							
n-Butlybenzene	0.5							
1,2-Dichlorobenzene	0.5							
1,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	R	R
,2,4-Trichlorobenzene	0.5	• •	, ,	• •	• •	, ,	• •	
Hexachlorobutadiene	0.5							
Naphthalene	0.5							
1,2,3-Trichlorobenzene	0.5							

Remarks:

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500

LABORATORY ID NO./SDG: E0476

	CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW263 E0476-43 WATER 1.0 ug/L	TW264 E0476-44 WATER 1.0 ug/L	TW265 E0476-45 WATER 1.0 ug/L	TW266 E0476-46 WATER 1.0 ug/L	TW37 E0476-47 WATER 1.0 ug/L		
	TARGET COMPOUNDS:	Danadina							
		Reporting Limit							
	Dichlorodifluoromethane	0.5							
	Chloromethane	0.5							
	Vinyl Chloride	0.5							
	Bromomethane	0.5							
	Chloroethane	0.5							
	Trichlorofluoromethane	0.5							
	1,1-Dichloroethene	0.5				1			
	Methylene Chloride	0.5		1.6					
	trans-1,2-Dichloroethene	0.5							
	Methyl tert-butyl ether	0.5							
	1.1-Dichloroethane	0.5	0.94	· 0.6		2.3			
-	cis-1 2-Dichloroethane	0.5						·	
_	2.2-Dichloropropane	0.5							
	1,2-Dichloroethane Bromochloromethane	0.5							
6 8	Bromochloromethane	0.5							
4	Chloroform	0.5						•	
٠,	Carbon Tetrachionide	0.5						•	
	1,1,1-Trichloroethane	0.5	1.8 J	1.1 J	0.84 J	4 J			
	1,1-Dichloropropene	0.5				4 =			
	Trichloroethene	0.5	0.51			1.5			
	1,2-Dichloropropane	0.5							
	Benzene	0.5							
	Dibromomethane	0.5 0.5							
	Bromodichloromethane cis-1,3-Dichloropropene	0.5 0.5							
	Toluene	0.5							
	Trans-1,3-Dichloropropene	0.5 0.5							
	1,1,2-Trichloroethane	0.5							
	Tetrachloroethene	0.5	1.2	0.56					
	1,3-Dichloropropane	0.5	··· -	. 0.00		•			
	Dibromochloromethane	0.5							
	1,2-Dibromoethane	0.5							
	Chlorobenzene	0.5							
	1,1,2,2-Tetrachloroethane	0.5						•	
	Ethylbenzene	0.5		•				•	
	m,p-Xylene	0.5				•		•	
								·	

SMITH TOWN, LONG ISLAND DCN # START-02-F-01788 CLIENT PROJECT NO.: 2500 LABORATORY ID NO./SDG: E0476

CLIENT SAMPLE ID: LAB SAMPLE ID: MATRIX: DILUTION FACTOR: UNITS		TW263 E0476-43 WATER 1.0 ug/L	TW264 E0476-44 WATER 1.0 ug/L	TW265 E0476-45 WATER 1.0 ug/L	TW266 E0476-46 WATER 1.0 ug/L	TW37 E0476-47 WATER 1.0 ug/L	
TARGET COMPOUNDS:							
TARGET COMPOUNDS.	Reporting						
	Limit						
o-Xylene	0.5						
Styrene	0.5						
Bromoform	0.5						
sopropylbenzene	0.5						
,1,2,2-Tetrachloroethane	0.5						
Bromobenzene	0.5						
1,2,3-Trichloropropane	0.5						
n-Propylbenzene	0.5						
2-Chlorotoluene	0.5						
I,3,5-Trimethylbenzene	0.5						
4-Chlorotoluene	0.5						
ert-Butylbenzene	0.5						
,2,4-Trimethylbenzene	0.5						
sec-Butlybenzene	0.5						
1,3-Dichlorobenzene	0.5						•
1-Isopropyltoluene	0.5						
I,4-Dichlorobenzene	0.5						
n-Butlybenzene	0.5						•
,2-Dichlorobenzene	0.5			•			
,2-Dibromo-3-chloropropane	0.5	R	R	R	R	R	
1,2,4-Trichlorobenzene	0.5						
lexachlorobutadiene	0.5						
Naphthalene	0.5						
1,2,3-Trichlorobenzene	0.5						

Remarks:



Appendix C Laboratory Reported Result

EPA SAMPLE NO.

TB03	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-01

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4418

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. ___

CAS NO.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50	TT
74-87-3	Chloromethane	0.50	
75-01-4	Vinyl Chloride	0.50	_
74-83-9	Bromomethane	0.50	
75-00-3	Chloroethane	0.50	
75-69-4	Trichlorofluoromethane	0.50	1
75-35-4	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
	1,1-Dichloroethane	0.50	
156-59-2	cis-1,2-Dichloroethene	0.50	-
590-20-7	2,2-Dichloropropane	0.50	
	1,2-Dichloroethane	0.50	_
74-97-5	Bromochloromethane	0.50	_
67-66-3	Chloroform		U
	Carbon Tetrachloride	13 0.50	T T
	1,1,1-Trichloroethane	0.50	
563-50-6	1,1-Dichloropropene		
79-01-6	Trichloroethene	0.50	
79-01-0	1,2-Dichloropropane	0.50	
71-43-2	Benzene	0.50	
71 45 2	Dibromomethane	0.50	
75-27-4	Bromodichloromethane	0.50	_
10061-01-5	cis-1,3-Dichloropropene	0.50	_
108-88-3	Tolueno	0.50	•
	trans-1,3-Dichloropropene	0.50	
7000. 5	1,1,2-Trichloroethane	0.50	_
19700-5	Tetrachloroethene	0.50	
1/2-20-4	1,3-Dichloropropane	0.50	
194_40-3	Dibromochloromethane	0.50	
10602 4	1 2 Dibromothane	0.50	
100-33-4	1,2-Dibromoethane Chlorobenzene	0.50	_
T00-30-1	Chioropenzene	0.50	U

FORM I VOA

OLMO3.0

EPA SAMPLE NO.

TB03

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-01

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4418

- .

(low/med) I

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V2D4410

Level:

LOW

Date Received: 04/07/98

% Moisture: not dec. ___

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	U
100-41-4Ethylbenzene	0.50	U
136777-61-2m,p-Xylene	0.50	U
95-47-6o-Xylene	0.50	U
100-42-5Styrene	0.50	U
75-25-2Bromoform	0.50	U
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	-
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	U
95-49-82-Chlorotoluene	0.50	Ū
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene		
98-06-6tert-Butylbenzene	0.50	Ū
95-63-61,2,4-Trimethylbenzene	0.50	Ū
135-98-8sec-Butylbenzene	0.50	Ū
541-73-11,3-Dichlorobenzene	1	Ū
99-87-64-Isopropyltoluene	0.50	Ū
106-46-71,4-Dichlorobenzene	0.50	Ū
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.60	
87-61-61,2,3-Trichlorobenzene	1	Ū
	li	

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OLMO3.0

EPA SAMPLE NO.

TW22

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-02

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4419

Level: (low/med) LOW

Date Received: 04/07/98

Date Analyzed: 04/07/98

% Moisture: not dec.

ID: 0.25 (mm)

Dilution Factor: 1.0

GC Column: DB-624

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	IJ
74-87-3Chloromethane		Ū
75-01-4Vinyl Chloride	1	Ü
74-83-9Bromomethane	1	Ū
75-00-3Chloroethane	i i	Ü
75-69-4Trichlorofluoromethane		Ū.
75-35-41,1-Dichloroethene		U
75-09-2Methylene Chloride		U
156-60-5trans-1,2-Dichloroethene	•	Ü
1634-04-4Methyl tert-butyl ether	1.1	0
75-34-31,1-Dichloroethane		Ū
156-59-2cis-1,2-Dichloroethene		Ü
590-20-72,2-Dichloropropane	1	Ü
107-06-21,2-Dichloroethane		U
74-97-5Bromochloromethane	1	Ü
67-66-3Chloroform		Ü
56-23-5Carbon Tetrachloride		Ü
71-55-61,1,1-Trichloroethane	· · · · · · · · · · · · · · · · · · ·	U
563-58-61,1-Dichloropropene	0.50	_
79-01-6Trichloroethene	Y	Ü
78-87-51,2-Dichloropropane		Ü
71-43-2Benzene		U
74-95-3Dibromomethane		Ü
75-27-4Bromodichloromethane		Ū
10061-01-5cis-1,3-Dichloropropene	1	บั
108-88-3Toluene		Ŭ
10061-02-6trans-1,3-Dichloropropene	1	Ū
79-00-51,1,2-Trichloroethane	1	Ŭ
127-18-4Tetrachloroethene		Ŭ
142-28-91,3-Dichloropropane	1	Ŭ
124-48-1Dibromochloromethane		Ū
106-93-41,2-Dibromoethane	1	Ŭ
108-90-7Chlorobenzene		Ŭ
		-
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FORM I VOA

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

MITKEM Case No.:

SAS No.:

SDG No.: E0476

naciix. (BOII)

Matrix: (soil/water) WATER

LOW

Lab Sample ID: E0476-02

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4419

Level:

(low/med)

_

_ . . _ . . .

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

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Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
95-47-6	0.50	-
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	-
		-
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	_
103-65-1n-Propylbenzene_	0.50	i -
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	Ū
98-06-6tert-Butylbenzene	0.50	Ū
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	υ.
96-12-81,2-Dibromo-3-chloropropane	0.50	IF R
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	lυ
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U
0, 01 0 1,2,3 1110H101020H10H010	0.50	_
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EPA SAMPLE NO.

TW23

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-03

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4420

Level: (low/med)

LOW

Date Analyzed: 04/07/98

Date Received: 04/07/98

% Moisture: not dec.

ID: 0.25 (mm)

Dilution Factor: 1.0

GC Column: DB-624

CAS NO.

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	TT
74-87-3Chloromethane	0.50	_
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	1
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane		U
156-59-2cis-1,2-Dichloroethene	1.0	
590-20-72,2-Dichloropropane	1.2	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	1
67-66-3Chloroform	0.50	
	0.50	
56-23-5Carbon Tetrachloride	0.50	Ų_ —
71-55-61,1,1-Trichloroethane	0.96	
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	U
127-18-4Tetrachloroethene	1.9	
142-28-91,3-Dichloropropane	-0.50	Ū
124-48-1Dibromochloromethane	0.50	U
106-93-41,2-Dibromoethane	0.50	U
108-90-7Chlorobenzene	0.50	U
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FORM I VOA

EPA SAMPLE NO.

TW23

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-03

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4420

Level: (low/med)

LOW

Date Received: 04/07/98

Date Analyzed: 04/07/98

% Moisture: not dec. ___

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume:____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	ΤŢ
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	I -
95-47-6o-Xylene	0.50	-
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	1
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethane	0.50	-
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	-
108-67-81,3,5-Trimethylbenzene	0.50	Ū
106-43-44-Chlorotoluene	0.50	_
98-06-6tert-Butylbenzene	0.50	_
95-63-61,2,4-Trimethylbenzene	0.50	_
135-98-8sec-Butylbenzene	0.50	Ū
541-73-11,3-Dichlorobenzene	0.50	_
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	υ
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U 🖍
96-12-81,2-Dibromo-3-chloropropane	0.50	UK
120-82-11,2,4-Trichlorobenzene	0.50	U
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U

FORM I VOA

EPA SAMPLE NO.

TW24

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-04

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4421

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	ŢŢ
74-87-3Chloromethane	0.50	_
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	_
75-69-4Trichlorofluoromethane	0.50	_
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	_
1634-04-4Methyl tert-butyl ether	0.87	_
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	_
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	1.0	U -
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene		-
78-87-51,2-Dichloropropane	0.50	
71-43-2Benzene	0.50 0.50	
74-95-3Dibromomethane	i e	i e
75-27-4Bromodichloromethane	0.50 0.50	_
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene		
10061-02-6trans-1,3-Dichloropropene	0.50	_
79-00-51,1,2-Trichloroethane	0.50	ľ
127-18-4Tetrachloroethene	0.50	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
	0.50	-
106-93-41,2-Dibromoethane	0.50	_
108-90-7Chlorobenzene	0.50	U

FORM I VOA

EPA SAMPLE NO.

Lab Name:	MITKEM COR	P.	Contract	:	TW24	
Lab Code:	MITKEM	Case No.:	SAS No.	: SDG	No.: E0476	
Matrix: (soil/water)	WATER		Lab Sample ID:	E0476-04	
Sample wt	/vol:	25.00 (g/mL)	ML	Lab File ID:	V2B4421	
Level:	(low/med)	LOW		Date Received:	04/07/98	

% Moisture: not dec. _____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: CAS NO. COMPOUND (uq/L or uq/Kq) UG/L

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 0.50
96-12-81,2-Dibromo-3-chloropropane	0.50 B R

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FORM I VOA

EPA SAMPLE NO.

TW25

Lab Name: MITKEM CORP.

Contract:

SAS No.:

 $\sigma_{ij} = \sigma_{ij} + \sigma_{ij} + \sigma_{ij}$

Case No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-05

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID: V2B4422

Level: (low

(low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50	TT	
	Chloromethane	0.50		1
	Vinyl Chloride	0.50	1 -	,
	Bromomethane	0.50	-	
	Chloroethane	0.50		
	Trichlorofluoromethane	0.50		
75-35-4	1,1-Dichloroethene	l .		
	Methylene Chloride	0.50	i e	
150 00 5	Methyrene chroride	0.50		
156-60-5	trans-1,2-Dichloroethene	0.50		
	Methyl tert-butyl ether	0.50	1	l
/5-34-3	1,1-Dichloroethane	0.59		*
156-59-2	cis-1,2-Dichloroethene	100		110#
590-20-7	2,2-Dichloropropane	0.50		İ
	1,2-Dichloroethane	0.50		1
	Bromochloromethane	0.50	U	
67-66-3		0.50	U	
	Carbon Tetrachloride	0.50	U _	1
71-55-6	1,1,1-Trichloroethane	0.93	J	ļ
563-58-6	1,1-Dichloropropene	0.50		
79-01-6	Trichloroethene	1.9		
78-87-5	1,2-Dichloropropane	0.50		İ
71-43-2	Benzene	0.50		•
74-95-3	Dibromomethane	0.50		
75-27-4	Bromodichloromethane	0.50		
10061-01-5	cis-1,3-Dichloropropene	0.50		
108-88-3	Toluene	0.50		
10061-02-6	trans-1,3-Dichloropropene	0.50		
79-00-5	1,1,2-Trichloroethane	0.50		
	Tetrachloroethene	14	1	1
	1,3-Dichloropropane	0.50		
124-48-1	Dibromochloromethane	0.50	1	
	1,2-Dibromoethane	0.50		
108-90-7	Chlorobenzene	0.50	1	
100)0 /	CHIOLODGHZEHE	0.50	٦	` `
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* Reported from 5 Lord dilltion FORM I VOA

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EPA SAMPLE NO.

TW25

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-05

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4422

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

ID: 0.25 (mm)

Dilution Factor: 1.0

Date Analyzed: 04/08/98

GC Column: DB-624

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6Styrene 100-42-5Bromoform 98-82-8Isopropylbenzene 79-34-5	0.50 0.50
135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene 99-87-64-Isopropyltoluene 106-46-71,4-Dichlorobenzene 104-51-8n-Butylbenzene	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U

EPA SAMPLE NO.

TW25DL

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-05DL

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4442

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 5.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

		· · · · · · · · · · · · · · · · · · ·	
75-71-8	Dichlorodifluoromethane	2.5	U
	Chloromethane	2.5	
	Vinyl Chloride	2.5	
	Bromomethane	2.5	
	Chloroethane	2.5	
	Trichlorofluoromethane	2.5	_
75-35-4	1,1-Dichloroethene	2.5	_
75-09-2	Methylene Chloride		
156-60-5	trans-1,2-Dichloroethene	2.5	
1634-04-4	Methyl tert-butyl ether	2.5	
75 24 2	1,1-Dichloroethane	2.5	
156 50 2	1,1-Dichioroethane	2.5	
156-59-2	cis-1,2-Dichloroethene	110	
590-20-7	2,2-Dichloropropane	2.5	
107-06-2	1,2-Dichloroethane	2.5	
	Bromochloromethane	2.5	U
	Chloroform	2.5	
56-23-5	Carbon Tetrachloride	2.5	
71-55-6	1,1,1-Trichloroethane	2.5	
563-58-6	1,1-Dichloropropene	2.5	שׁ
79-01-6	Trichloroethene	2.5	U
78-87-5	1,2-Dichloropropane	2.5	שו
71-43-2	Benzene	2.5	
74-95-3	Dibromomethane	2.5	
75-27-4	Bromodichloromethane	2.5	
10061-01-5	cis-1,3-Dichloropropene	2.5	
108-88-3	Toluene	2.5	
10061-02-6	trans-1,3-Dichloropropene	2.5	
79-00-5	1,1,2-Trichloroethane	2.5	
127-18-4	Tetrachloroethene	15	
	1,3-Dichloropropane	2.5	
124-48-1	Dibromochloromethane	2.5	
106-93-4	1,2-Dibromoethane	2.5	
108-90-7	Chlorobenzene	2.5	
_00 00 /		2.5	١
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See the original South and FORM I VOA

EPA SAMPLE NO.

TW25DL

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

LOW

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-05DL

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4442

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 5.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	2.5 U
100-41-4Ethylbenzene	2.5 U
136777-61-2m,p-Xylene	2.5 U
95-47-6o-Xylene	2.5 U
100-42-5Styrene	2.5 U
75-25-2Bromoform	2.5 U
98-82-8Isopropylbenzene	2.5 U
79-34-51,1,2,2-Tetrachloroethane	2.5 U
108-86-1Bromobenzene	2.5 U
96-18-41,2,3-Trichloropropane	2.5 U
103-65-1n-Propylbenzene	2.5 U
95-49-82-Chlorotoluene	2.5 U
108-67-81,3,5-Trimethylbenzene	2.5 U
106-43-44-Chlorotoluene	2.5 U
98-06-6tert-Butylbenzene	2.5 0
95-63-61,2,4-Trimethylbenzene	2.5 U
135-98-8sec-Butylbenzene	2.5 U
541-73-11,3-Dichlorobenzene	2.5 U
99-87-64-Isopropyltoluene	2.5 U
106-46-71,4-Dichlorobenzene	2.5 U
104-51-8n-Butylbenzene	2.5 U
95-50-11,2-Dichlorobenzene	2.5 0
96-12-81,2-Dibromo-3-chloropropane	2.5
120-82-11,2,4-Trichlorobenzene	2.5 U
87-68-3Hexachlorobutadiene	2.5 U
91-20-3Naphthalene	2.5 U
87-61-61,2,3-Trichlorobenzene	2.5 U
o, or or,z,z irremore delizene	2.5

EPA SAMPLE NO.

TW26

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-06

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4423

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50	τ ι
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	•
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	t .
1634-04-4	Methyl tert-butyl ether	0.50	1
	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50) -
590-20-7	2,2-Dichloropropane	0.50	1 -
107-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
67-66-3	Chloroform	0.50	
	Carbon Tetrachloride	0.50	_
71-55-6	1,1,1-Trichloroethane	0.50	-
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	
71-43-2	Benzene	0.50	
	Dibromomethane	0.50	
75-27-4	Bromodichloromethane	0.50	
10061-01-5	cis-1,3-Dichloropropene	0.50	
108-88-3	Toluene	0.50	-
	trans-1,3-Dichloropropene	0.50	_
79-00-5	1,1,2-Trichloroethane	0.50	
127-18-4	Tetrachloroethene	0.50	_
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	
106-93-4	1,2-Dibromoethane	0.50	_
108-90-7	Chlorobenzene	0.50	_
		0.50	

FORM I VOA

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-06

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4423

LOW

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

1		
630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	
95-47-6	0.50	-
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	i
98-82-8Isopropylbenzene	0.50	1
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene		1
	0.50	1 -
96-18-41,2,3-Trichloropropane	0.50	1 -
103-65-1n-Propylbenzene	0.50	1 -
95-49-82-Chlorotoluene	0.50	1 -
108-67-81,3,5-Trimethylbenzene	0.50	_
106-43-44-Chlorotoluene	0.50	, -
98-06-6tert-Butylbenzene	0.50	-
95-63-61,2,4-Trimethylbenzene	0.50	_
135-98-8sec-Butylbenzene	0.50	Ū
541-73-11,3-Dichlorobenzene	0.50	_
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	Ū
95-50-11,2-Dichlorobenzene	0.50	U ,
96-12-81,2-Dibromo-3-chloropropane	0.50	W/K
120-82-11,2,4-Trichlorobenzene	0.50	ע ֿ`
87-68-3Hexachlorobutadiene	0.50	שׁ
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U
1		

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-07

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/ml) ML

Lab File ID:

V2B4441

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

	··· 5, = ···	3,3,0, 2	×
75-71-8	Dichlorodifluoromethane	0.50	ττ
74-87-3	Chloromethane	0.50	
75-01-4	Vinyl Chloride	0.50	
74-83-9	Bromomethane	0.50	1
75-00-3	Chloroethane	0.50	
75-69-4	Trichlorofluoromethane	0.50	
75-35-4	1,1-Dichloroethene	3.2	
75-09-2	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	
75-34-3	1,1-Dichloroethane	0.50	l .
156-59-2	cis-1,2-Dichloroethene	0.50	1
590-20-7	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
67-66-3	Chloroform	0.79	U
56-23-5	Carbon Tetrachloride	0.50	
71-55-6	1,1,1-Trichloroethane	- 0.30 17	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	
71-43-2	Benzene	0.50	TT
74-95-3	Dibromomethane	0.50	
75-27-4	Bromodichloromethane	0.50	
10061-01-5	cis-1,3-Dichloropropene	0.50	
108-88-3	Toluene	0.50	
10061-02-6	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	
127-18-4	Tetrachloroethene	0.50	7.T
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	
106-93-4	1, 2-Dibromoethane	0.50	
108-90-7	Chlorobenzene	0.50	
·		- 0.50	J
		-1	
		-310	

FORM I VOA

Sample wt/vol: 25.00 (g/mL) ML

EPA SAMPLE NO.

Lab File ID: V2B4441

Lab Name: MITKEM CORP.	Contract:	TW27
Lab Code: MITKEM Case No.:	SAS No.:	SDG No.: E0476
Matrix: (soil/water) WATER	Lab Sa	mple ID: E0476-07

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. ____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

		
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 U U U 0.50 U U U 0.50 U U U 0.50 U U U 0.50 U U 0.50 U U 0.50 U U 0.50 U U 0.50 U U 0.50 U U 0.50 U U U 0.50 U U U 0.50 U U	- R
104-51-8n-Butylbenzene 95-50-11,2-Dichlorobenzene	0.50 U 0.50 U	- R

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FORM I VOA

EPA SAMPLE NO.

TW28

Lab Name: MITKEM CORP.

Contract:

SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-08

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID: V2B4425

Level: (low/med)

<u>.</u>.

LOW

Case No.:

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ___ (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

		 	
75-71-8	Dichlorodifluoromethane	0.50	TT.
	Chloromethane	0.50	
75-01-4	Vinyl Chloride	0.50	
74-83-9	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
75-09-2	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene		
1634-04-4	Methyl tert-butyl ether	0.50	
75 24 2	1,1-Dichloroethane	0.50	
156 50 0	aig 1 2 Dighleresthere	0.50	
130-33-2	cis-1,2-Dichloroethene	0.50	
390-20-7	2,2-Dichloropropane	0.50	
10/-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
	Chloroform	0.50	
56-23-5	Carbon Tetrachloride	0.50	
71-55-6	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
71-43-2	Benzene	0.50	Ū
	Dibromomethane	0.50	U
75-27-4	Bromodichloromethane	0.50	Ü
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	
10061-02-6	trans-1,3-Dichloropropene	1	Ū
79-00-5	1,1,2-Trichloroethane		Ū
127-18-4	Tetrachloroethene	0.50	
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	
106-93-4	1,2-Dibromoethane	,	IJ
108-90-7	Chlorobenzene	1	U
		0.30	_
······		0.00	

386

EPA SAMPLE NO.

TW28

Lab Name: MITKEM CORP.

Lab Code: MITKEM

Contract:

SAS No.:

Case No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-08

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4425

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

	· · · - · · · · · · · · · · · · · · · ·	
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	
104-51-8n-Butylbenzene 95-50-11,2-Dichlorobenzene	0.50 0.50 0.50	U U U U U U

EPA SAMPLE NO.

TW29

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-09

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4426

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: 'not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	IJ
74-87-3Chloromethane	0.50	_
75-01-4Vinyl Chloride	0.50	-
74-83-9Bromomethane	0.50	_
75-00-3Chloroethane	0.50	t ·
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene		
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
500 20 7 2 2 Dight and a second of the secon	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.50	ř .
563-58-61,1-Dichloropropene	0.50	_
79-01-6Trichloroethene	0.50	U
78-87-51,2-Dichloropropane	0.50	U
71-43-2Benzene	0.50	U
74-95-3Dibromomethane	0.50	U
75-27-4Bromodichloromethane	0.50	U
10061-01-5cis-1,3-Dichloropropene	0.50	U
108-88-3Toluene	0.50	U
10061-02-6trans-1,3-Dichloropropene	0.50	U
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	_
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	_
106-93-41,2-Dibromoethane	0.50	_
108-90-7Chlorobenzene	0.50	
	0.50	•

EPA SAMPLE NO.

TW29

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4426

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Soil Extract Volume: (uL)

CAS NO.

Date Analyzed: 04/08/98

Lab Sample ID: E0476-09

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene	0.50 0.50 0.50	U
95-47-6	0.50 0.50 0.50 0.50	U
79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene 96-18-41,2,3-Trichloropropane	0.50 0.50 0.50	บ บ
103-65-1n-Propylbenzene 95-49-82-Chlorotoluene 108-67-81,3,5-Trimethylbenzene 106-43-44-Chlorotoluene	0.50 0.50 0.50 0.50	U U
98-06-6tert-Butylbenzene 95-63-61,2,4-Trimethylbenzene 135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene	0.50 0.50 0.50 0.50	บ บ
99-87-64-Isopropyltoluene 106-46-71,4-Dichlorobenzene 104-51-8n-Butylbenzene	0.50 0.50 0.50	U U U
95-50-11,2-Dichlorobenzene 96-12-81,2-Dibromo-3-chloropropane 120-82-11,2,4-Trichlorobenzene 87-68-3Hexachlorobutadiene	0.50 0.50 0.50 0.50	U K
91-20-3Naphthalene 87-61-61,2,3-Trichlorobenzene	0.50 0.50	บ บ

EPA SAMPLE NO.

TW 30)	
TW30)	

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-10

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4443

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

		1	
75-71-8	Dichlorodifluoromethane	0.50	
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
74-83-9	Bromomethane	1	Ü
	Chloroethane		Ü
	Trichlorofluoromethane	1.	Ŭ.
	1,1-Dichloroethene	1	U .
75-09-2	Methylene Chloride		IJ
156-60-5	trans-1,2-Dichloroethene	1 1	IJ
1634-04-4	Methyl tert-butyl ether	1	IJ
75-34-3	1,1-Dichloroethane	1	IJ
156-59-2	cis-1,2-Dichloroethene	i I	J
590-20-7	2,2-Dichloropropane	ł I	J
107-06-2	1,2-Dichloroethane	1	J
74-97-5	Bromochloromethane	1	~
	Chloroform	1	J
	Carbon Tetrachloride	1	J
	1,1,1-Trichloroethane	0.50	_
71-55-6	1,1,1-111Chioroethane	0.50 0	
70 01 6	1,1-Dichloropropene	0.50 [-
79-01-6	Irichioroethene	0.50	
78-87-5	1,2-Dichloropropane		J
71-43-2		0.50	_
	Dibromomethane	0.50 [-
75-27-4	Bromodichloromethane		J
10061-01-2	cis-1,3-Dichloropropene	0.50 t	-
108-88-3		0.50 t	_
10061-02-6	trans-1,3-Dichloropropene	0.50 t	
79-00-5	1,1,2-Trichloroethane	0.50 t	_
127-18-4	Tetrachloroethene	0.50 t	
142-28-9	1,3-Dichloropropane	0.50 \	-
124-48-1	Dibromochloromethane	0.50 t	J
106-93-4	1,2-Dibromoethane	0.50 t	J
108-90-7	Chlorobenzene	0.50 t	J
		· · _ · _ · _ · _ · · · · · · · · ·	

FORM I VOA

EPA SAMPLE NO.

TW30

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-10

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4443

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50 0.50 0.50	บ บ บ บ
100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50 0.50 0.50	บ บ บ บ
136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50 0.50	บ บ บ
95-47-6Styrene 100-42-5Styrene 75-25-2	0.50 0.50 0.50 0.50	n n
100-42-5Styrene 75-25-2Bromoform	0.50 0.50 0.50	U U
75-25-2Bromoform	0.50 0.50	Ū
	0.50	
00 00 0 Tannyony/hongono		
)		1
l · · · · · · · · · · · · · · · · · · ·	0.50	1 -
	0.50	1 -
	0.50	-
	0.50	1 -
	0.50	1 -
	0.50	1 -
	0.50	
	0.50	
	0.50	l .
<u> </u>	0.50	_
	0.50	U
	0.50	U U
	0.50	U
104-51-8n-Butylbenzene	0.50	U
	0.50	
96-12-81,2-Dibromo-3-chloropropane	0.50	W X
	0.50	
	0.50	U
	0.50	บ
	0.50	[บ
· ·		

EPA SAMPLE NO.

TW31

Lab Name: MITKEM CORP.

Contract:

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-11

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID:

V2B4428

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

	·-·	
75-71-8Dichlorodifluoromethane	0.50	Ţ
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane		Ü
75-00-3Chloroethane		Ü
75-69-4Trichlorofluoromethane		Ŭ
75-35-41,1-Dichloroethene	0.50	_
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene		Ŭ
590-20-72,2-Dichloropropane	0.50	-
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	-
67-66-3Chloroform	0.94	U
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.50	U
563-58-61,1-Dichloropropene	1	U
79-01-6Trichloroethene		Ū
78-87-51,2-Dichloropropane		Ü
71-43-2Benzene		Ü
74-95-3Dibromomethane	0.50	ט
75-27-4Bromodichloromethane	0.50	ט
10061-01-5cis-1,3-Dichloropropene	0.50	IJ.
108-88-3Toluene	0.50	IJ
10061-02-6trans-1,3-Dichloropropene	0.50	IJ
79-00-51,1,2-Trichloroethane —	0.50	U i
127-18-4Tetrachloroethene	0.50	ן ט
142-28-91,3-Dichloropropane	0.50	IJ
124-48-1Dibromochloromethane	0.50	ן ע
106-93-41,2-Dibromoethane	0.50	ן ט
108-90-7Chlorobenzene	0.50	ן ע

EPA SAMPLE NO.

TW31	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-11

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4428

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	U
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	_
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	-
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	_
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	*	_
	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	_
95-63-61,2,4-Trimethylbenzene	0.50	_
135-98-8sec-Butylbenzene	0.50	_
541-73-11,3-Dichlorobenzene	0.50	_
99-87-64-Isopropyltoluene	0.50	_
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U a
96-12-81,2-Dibromo-3-chloropropane	0.50	B K
120-82-11,2,4-Trichlorobenzene	0.50	U
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U
	l	

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EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-12

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4429

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	U
74-87-3Chloromethane		-
75-01-4Vinyl Chloride	0.50	ם
74-83-9Bromomethane	0.50 0.50	U U
75-00-3Chloroethane		U
75-69-4Trichlorofluoromethane	0.50	_
75-35-41,1-Dichloroethene	0.50	Ŭ
75-09-2Methylene Chloride	0.50	Ŭ
156 60 F	0.50	Ŭ
156-60-5trans-1,2-Dichloroethene	0.50	U
1634-04-4Methyl tert-butyl ether	0.50	U
75-34-31,1-Dichloroethane	0.50	U
156-59-2cis-1,2-Dichloroethene		U
590-20-72,2-Dichloropropane	0.50	U
107-06-21,2-Dichloroethane		U
74-97-5Bromochloromethane	0.50	Ŭ
67-66-3Chloroform	0.50	U
56-23-5Carbon Tetrachloride	0.50	U
71-55-61,1,1-Trichloroethane	0.50	U
563-58-61,1-Dichloropropene	0.50	U
79-01-6Trichloroethene	0.50	U
78-87-51,2-Dichloropropane	0.50	Ū
71-43-2Benzene	0.50	Ū
74-95-3Dibromomethane	0.50	Ū
75-27-4Bromodichloromethane	0.50	Ū
10061-01-5cis-1,3-Dichloropropene	0.50	Ū
108-88-3Toluene	0.50	Ū
10061-02-6trans-1,3-Dichloropropene	0.50	Ū
79-00-51,1,2-Trichloroethane	0.50	Ŭ
127-18-4Tetrachloroethene	0.50	Ū
142-28-91,3-Dichloropropane	0.50	Ŭ
124-48-1Dibromochloromethane	0.50	Ŭ
106-93-41,2-Dibromoethane	0.50	U
108-90-7Chlorobenzene		Ü
TOO SO . CHIOLOGOIDENC	0.50	J

EPA SAMPLE NO.

TW32	

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-12

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4429

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. ___

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

CAS NO.

Soil Aliquot Volume: (uL)

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

FORM I VOA

EPA SAMPLE NO.

TW33

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-13

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4430

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50 U	
74-87-3	Chloromethane	0.50U	
75-01-4	Vinyl Chloride	0.50 U	
74-83-9	Bromomethane	0.50 U	
	Chloroethane	0.50 U	
	Trichlorofluoromethane	0.50 U	
75-35-4	1,1-Dichloroethene	0.50 U	
75-09-2	Methylene Chloride	0.50 U	
156-60-5	trans-1,2-Dichloroethene	0.50 U	
1634-04-4	Methyl tert-butyl ether	0.50 U	
75-34-3	1,1-Dichloroethane	0.50 U	
156-59-2	cis-1,2-Dichloroethene	I i	
	2,2-Dichloropropane	0.50 U	
107 06 2	1,2-Dichloroethane	0.50 U	
74 07 5	Bromochloromethane	0.50 U	
(7 (6)	Bromochioromethane	0.50 U	
		0.50 U	
56-23-5	Carbon Tetrachloride	0.50 U	
/1-55-6	1,1,1-Trichloroethane	0.50 U	
563-58-6	1,1-Dichloropropene	0.50 U	
79-01-6	Trichloroethene	0.50 บ	
78-87-5	1,2-Dichloropropane	0.50 U	
71-43-2		0.50 บ	
	Dibromomethane	0.50 U	
75-27-4	Bromodichloromethane	0.50 บ	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	
108-88-3		0.50 บ	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	
79-00-5	1,1,2-Trichloroethane	0.50 U	
127-18-4	Tetrachloroethene	0.50 U	
142-28-9	1,3-Dichloropropane	0.50 U	
124-48-1	Dibromochloromethane	0.50 U	
106-93-4	1,2-Dibromoethane	0.50 U	
108-90-7	Chlorobenzene	0.50 0	

FORM I VOA

EPA SAMPLE NO.

TW33	
1W33	

Lab Name: MITKEM CORP.

Contract:

SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-13

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Case No.:

Lab File ID: V2B4430

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50 U
100-41-4Ethylbenzene	0.50 บ
136777-61-2m,p-Xylene	0.50 U
95-47-6o-Xylene	0.50 บ
100-42-5Styrene	0.50 ប
75-25-2Bromoform	0.50 U
98-82-8Isopropylbenzene	0.50 U
79-34-51,1,2,2-Tetrachloroethane	0.50 U
108-86-1Bromobenzene	0.50 U
96-18-41,2,3-Trichloropropane	0.50 U
103-65-1n-Propylbenzene	0.50 U
95-49-82-Chlorotoluene	0.50 U
108-67-81,3,5-Trimethylbenzene	0.50 U
106-43-44-Chlorotoluene	0.50 U
98-06-6tert-Butylbenzene	0.50 U
95-63-61,2,4-Trimethylbenzene	0.50 U
135-98-8sec-Butylbenzene	0.50 U
541-73-11,3-Dichlorobenzene	0.50 U
99-87-64-Isopropyltoluene	0.50 U
106-46-71,4-Dichlorobenzene	0.50 U
104-51-8n-Butylbenzene	0.50 U
95-50-11,2-Dichlorobenzene	0.50 U
96-12-81,2-Dibromo-3-chloropropane_	0.50
120-82-11,2,4-Trichlorobenzene	0.50 U
87-68-3Hexachlorobutadiene	0.50 U
91-20-3Naphthalene	0.50 U
87-61-61,2,3-Trichlorobenzene	0.50 U

EPA SAMPLE NO.

TW34

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-14

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4431

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CAS NO. COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	IJ
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	Ū
74-83-9Bromomethane	0.50	Ū
75-00-3Chloroethane	0.50	U
75-69-4Trichlorofluoromethane	0.50	_
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	IJ
1634-04-4Methyl tert-butyl ether	0.58	U
75-34-31,1-Dichloroethane	0.50	U
156-59-2cis-1,2-Dichloroethene	0.50	Ü
590-20-72,2-Dichloropropane	0.50	-
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	2.4	T
563-58-61,1-Dichloropropene	0.50	TT
79-01-6Trichloroethene		Ū.
78-87-51,2-Dichloropropane	0.50	Ü
71-43-2Benzene		Ü
74-95-3Dibromomethane		Ŭ
75-27-4Bromodichloromethane		Ŭ
10061-01-5cis-1,3-Dichloropropene	1	Ŭ.
108-88-3Toluene	0.50	-
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	_
142-28-91,3-Dichloropropane	0.50	_
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	
	2.00	-

FORM I VOA

EPA SAMPLE NO.

TW34

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

LOW

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-14

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4431

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane		
135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-61,3-Dichlorobenzene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3	100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6	0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U
103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 99-87-61,3-Dichlorobenzene 0.50 U 99-87-61,4-Dichlorobenzene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U	108-86-1Bromobenzene	0.50 U
95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		. 1
108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-81,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U	95-49-82-Chlorotoluene	
106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8n-Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		1
95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8n-Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U	106-43-44-Chlorotoluene	1 -
135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8n-Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		
541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		
99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8n-Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		1
106-46-71,4-Dichlorobenzene 0.50 U 104-51-8n-Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		
95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		•
96-12-81,2-Dibromo-3-chloropropane 0.50 W K 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		
120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U		
87-68-3Hexachlorobutadiene0.50 U	96-12-81,2-Dibromo-3-chloropropane	0.50
91-20-3 Napricuatelle 0.50 0		
87-61-61,2,3-Trichlorobenzene 0.50 U		4
0,-01-0	0/-01-01,2,3-111CIIIOLODEIIZEIIE	0.30

-430

EPA SAMPLE NO.

TW35	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-15

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4432

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Date Analyzed: 04/08/98

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

75-71-8Dichlorodifluoromethane	0.50 0.50 0.50 0.50	Ū
75-01-4Vinyl Chloride	0.50	1
74-83-9Bromomethane		1
74-83-9Bromomethane		IU
		1
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	ŧ.
75-35-41,1-Dichloroethene	0.50	1
75-09-2Methylene Chloride	0.50	1
156-60-5trans-1,2-Dichloroethene	0.50	1
1634-04-4Methyl tert-butyl ether	0.60	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	1
590-20-72,2-Dichloropropane	0.50	-
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	•
71-55-61,1,1-Trichloroethane	2.4	T
563-58-61,1-Dichloropropene	0.50	TT
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	-
71-43-2Benzene	0.50	_
74-95-3Dibromomethane	0.50	-
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	_
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	
CHIOLODCHZCHC	0.50	١

FORM I VOA

EPA SAMPLE NO.

TW35

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-15

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4432

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	U
100-41-4Ethylbenzene	0.50	IJ
136777-61-2m,p-Xylene	0.50	
95-47-6o-Xylene	0.50	-
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	-
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane		
	0.50	
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	
99-87-64-Isopropyltoluene	0.50	-
106-46-71,4-Dichlorobenzene		
104-51-8n-Butylbenzene	0.50	
95-50-11,2-Dichlorobenzene	0.50	
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2-Dibromo-3-chioropropane_	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.

TW172

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-16

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4433

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

(13/2 01 03/		Q
75-71-8Dichlorodifluoromethane	0.50	TT
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	_
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1.2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.50	
563-58-61,1-Dichloropropene	0.50	
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	-
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	_
10061-01-5cis-1,3-Dichloropropene	0.50	Ū
108-88-3Toluene	0.50	U
10061-02-6trans-1,3-Dichloropropene	0.50	U
79-00-51,1,2-Trichloroethane	0.50	U
127-18-4Tetrachloroethene	0.50	U
142-28-91,3-Dichloropropane	0.50	U
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	U
108-90-7Chlorobenzene	0.50	U

FORM I VOA

EPA SAMPLE NO.

m. 170	
TW172	

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-16

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4433

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

			
100-41-4 136777-61-2 95-47-6 100-42-5 98-82-8 98-82-8 108-86-1 96-18-4 103-65-1 95-49-8 106-43-4 95-63-6 135-98-8 135-98-8 106-46-7 104-51-8 95-50-1	StyreneBromoformIsopropylbenzene1,1,2,2-TetrachloroethaneBromobenzene1,2,3-Trichloropropanen-Propylbenzene2-Chlorotoluene1,3,5-Trimethylbenzene4-Chlorotoluenetert-Butylbenzene1,2,4-Trimethylbenzene1,2,4-Trimethylbenzene1,3-Dichlorobenzene1,3-Dichlorobenzene1,4-Dichlorobenzene1,4-Dichlorobenzene1,2-Dichlorobenzene1,2-Dichlorobenzene	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	Ranganananananananananananananananananan
106-46-7 104-51-8 95-50-1 96-12-8 120-82-1 87-68-3 91-20-3	1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene	0.50 0.50 0.50	U U U U U U U U

FORM I VOA

EPA SAMPLE NO.

Lab Name: MITKEM CORP. Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER Lab Sample ID: E0476-17

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4434

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

75-71-8Dichlorodifluoromethane	0.50	II
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	U
67-66-3Chloroform	0.50	U
56-23-5Carbon Tetrachloride	0.50	U _
71-55-61,1,1-Trichloroethane	0.57	3
563-58-61,1-Dichloropropene	0.50	Ū
79-01-6Trichloroethene	0.50	U
78-87-51,2-Dichloropropane	0.50	U
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	Ų
		:

066-

FORM I VOA

EPA SAMPLE NO.

TW173

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-17

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4434

Level: (low/med)

LOW

Date Received: 04/07/98

Date Analyzed: 04/08/98

% Moisture: not dec.

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50 U
100-41-4Ethylbenzene	0.50 U
136777-61-2m,p-Xylene	0.50 U
95-47-6o-Xylene	0.50 U
100-42-5Styrene	0.50 U
75-25-2Bromoform	0.50 U
98-82-8Isopropylbenzene	* * * * * * * * * * * * * * * * * * * *
79-34-51,1,2,2-Tetrachloroethane	0.50 U
108-86-1Bromobenzene	0.50 U
06 10 4 1 2 2 Thigh	0.50 U
96-18-41,2,3-Trichloropropane	0.50 U
103-65-1n-Propylbenzene	0.50 U
95-49-82-Chlorotoluene	0.50 U
108-67-81,3,5-Trimethylbenzene	0.50 U
106-43-44-Chlorotoluene	0.50 U
98-06-6tert-Butylbenzene	0.50 U
95-63-61,2,4-Trimethylbenzene	0.50 U
135-98-8sec-Butylbenzene	0.50 U
541-73-11,3-Dichlorobenzene	0.50 U
99-87-64-Isopropyltoluene	0.50 U
106-46-71,4-Dichlorobenzene	0.50 ປັ
104-51-8n-Butylbenzene	0.50 ປັ
95-50-11,2-Dichlorobenzene	0.50 ប
96-12-81,2-Dibromo-3-chloropropane	0.50 FR
120-82-11,2,4-Trichlorobenzene	0.50 U
87-68-3Hexachlorobutadiene	0.50 บ
91-20-3Naphthalene	0.50 U
87-61-61,2,3-Trichlorobenzene	0.50 U

FORM I VOA

EPA SAMPLE NO.

TW174

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-18

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4444

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

1			
74-87-3	Dichlorodifluoromethane Chloromethane Vinyl Chloride	0.50 0.50 0.50	ប
74-83-9 75-00-3 75-69-4	Bromomethane Chloroethane Trichlorofluoromethane 1,1-Dichloroethene	0.50 0.50 0.50 0.50	n n
75-09-2 156-60-5 1634-04-4	Methylene Chloridetrans-1,2-DichloroetheneMethyl tert-butyl ether1,1-Dichloroethane	0.50 0.50 0.50 0.50	บ บ บ
156-59-2 590-20-7 107-06-2	cis-1,2-Dichloroethene 2,2-Dichloropropane 1,2-Dichloroethane Bromochloromethane	0.50 0.50 0.50 0.50	บ บ บ
67-66-3 56-23-5 71-55-6	ChloroformCarbon Tetrachloride1,1,1-Trichloroethane1,1-Dichloropropene	0.50 0.50 0.50 0.50	U U U
79-01-6 78-87-5 71-43-2	Trichloroethene 1,2-Dichloropropane	0.50 0.50 0.50 0.50	U U U
75-27-4 10061-01-5 108-88-3	Bromodichloromethane cis-1,3-Dichloropropene	0.50 0.50 0.50	U U U
79-00-5 127-18-4 142-28-9	1,1,2-Trichloroethane Tetrachloroethene 1,3-Dichloropropane	0.50 0.50 0.50 0.50	บ บ บ
106-93-4	Dibromochloromethane 1,2-Dibromoethane Chlorobenzene	0.50 0.50 0.50	U

FORM I VOA

Case No.:

Lab Name: MITKEM CORP.

Matrix: (soil/water) WATER

Lab Code: MITKEM

EPA SAMPLE NO.

TW174 Contract: SAS No.: SDG No.: E0476 Lab Sample ID: E0476-18 Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4444

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. Date Analyzed: 04/08/98

ID: 0.25 (mm) Dilution Factor: 1.0 GC Column: DB-624

Soil Aliquot Volume: (uL) Soil Extract Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
95-47-6	0.50	_
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene		
70 34 5 1 1 2 2 Westward arouthous		_
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U ,
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	
		_
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FORM I VOA

OLMO3.0

EPA SAMPLE NO.

TW175

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-19

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4445

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

-			
75-71-8	Dichlorodifluoromethane	0.50	Ū
	Chloromethane	0.50	Ū
75-01-4	Vinyl Chloride	0.50	U
	Bromomethane	0.50	_
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	Ū.
75-35-4	1,1-Dichloroethene	0.50	Ū
75-09-2	Methylene Chloride	0.50	Ū
156-60-5	trans-1,2-Dichloroethene	0.50	U
1634-04-4	Methyl tert-butyl ether	0.50	IJ
	1,1-Dichloroethane	0.50	Ū
156-59-2	cis-1,2-Dichloroethene	0.50	U
590-20-7	2,2-Dichloropropane	0.50	U
107-06-2	1,2-Dichloroethane	0.50	-
74-97-5	Bromochloromethane	0.50	Ü
	Chloroform	0.50	Ü
	Carbon Tetrachloride		Ü
71-55-6	1,1,1-Trichloroethane	0.62	٦ ٦
563-58-6	1,1-Dichloropropene	0.50	TT
79-01-6	Trichloroethene		U
78-87-5	1,2-Dichloropropane	0.50	U
71-43-2	Benzene	0.50	Ü
	Dibromomethane	0.50	Ü
75-27-4	Bromodichloromethane	0.50	Ŭ
10061-01-5	cis-1,3-Dichloropropene	0.50	Ŭ
108-88-3	Toluene	0.50	Ŭ
10061-02-6	trans-1,3-Dichloropropene	0.50	Ŭ
79-00-5	1,1,2-Trichloroethane	0.50	Ŭ
127-18-4	Tetrachloroethene		Ū
142-28-9	1,3-Dichloropropane	0.50	-
124-48-1	Dibromochloromethane	0.50	Ü
106-93-4	1,2-Dibromoethane	0.50	IJ
108-90-7	Chlorobenzene		Ū
		2.33	-
		·	

FORM I VOA

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-19

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4445

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

Soil Extract Volume: (uL)

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

1		
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene	0.50 0.50 0.50	Ū
95-47-6o-Xylene 100-42-5Styrene	0.50 0.50	_
75-25-2Bromoform 98-82-8Isopropylbenzene	0.50 0.50	Ū
79-34-51,1,2,2-Tetrachloroethane	0.50	Ū
108-86-1Bromobenzene 96-18-41,2,3-Trichloropropane	0.50 0.50	-
103-65-1n-Propylbenzene 95-49-82-Chlorotoluene	0.50 0.50	_
108-67-81,3,5-Trimethylbenzene 106-43-44-Chlorotoluene	0.50 0.50	Ŭ
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene 135-98-8sec-Butylbenzene	0.50 0.50	_
541-73-11,3-Dichlorobenzene 99-87-64-Isopropyltoluene	0.50 0.50	
106-46-71,4-Dichlorobenzene 104-51-8n-Butylbenzene	0.50 0.50	U
95-50-11,2-Dichlorobenzene	0.50	U
96-12-81,2-Dibromo-3-chloropropane 120-82-11,2,4-Trichlorobenzene	0.50 0.50	
87-68-3Hexachlorobutadiene 91-20-3Naphthalene	0.50 0.50	_
87-61-61,2,3-Trichlorobenzene	0.50	

FORM I VOA

Case No.:

Lab Code: MITKEM

EPA SAMPLE NO.

SDG No.: E0476

Lab Name: MITKEM CORP. Contract:

SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: E0476-20

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4446

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. ____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ___ (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

75-71-8	0.50 0.50	מממ ממממממממ ממממממממממממממממ
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FORM I VOA

EPA SAMPLE NO.

TW176

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-20

Sample wt/vol:

25.00 (g/mL) ML

LOW

Lab File ID:

V2B4446

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

0

100-41-4Ethylbenzene			
100-41-4Ethylbenzene	630-20-61 1 1 2-Tetrachloroethane	0.50	TT
136777-61-2m, p-Xylene	100-41-4		
95-47-6			
100-42-5			_
75-25-2Bromoform 0.50 U 98-82-8Isopropylbenzene 0.50 U 79-34-51,1,2,2-Tetrachloroethane 0.50 U 108-86-1Bromobenzene 0.50 U 96-18-41,2,3-Trichloropropane 0.50 U 103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 99-87-61,3-Dichlorobenzene 0.50 U 99-87-61,4-Dichlorobenzene 0.50 U 104-51-81,2-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dichlorobenzene 0.50 U 96-12-81,2-Dichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U			
98-82-8			
79-34-51,1,2,2-Tetrachloroethane 0.50 U 108-86-1Bromobenzene 0.50 U 96-18-41,2,3-Trichloropropane 0.50 U 103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 95-87-61,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 104-51-81,4-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U			
108-86-1Bromobenzene 0.50 U 96-18-41,2,3-Trichloropropane 0.50 U 103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 104-51-81,4-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U			
96-18-41,2,3-Trichloropropane 0.50 U 103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dichlorobenzene 0.50 U 96-12-81,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U		0.50	U
103-65-1n-Propylbenzene 0.50 U 95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U		0.50	U
95-49-82-Chlorotoluene 0.50 U 108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U	96-18-41,2,3-Trichloropropane	0.50	U
108-67-81,3,5-Trimethylbenzene 0.50 U 106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U	103-65-1n-Propylbenzene	0.50	U
106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-81,2-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U	95-49-82-Chlorotoluene	0.50	U
106-43-44-Chlorotoluene 0.50 U 98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-81,2-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U	108-67-81,3,5-Trimethylbenzene	0.50	U
98-06-6tert-Butylbenzene 0.50 U 95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-81,2-Dichlorobenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3			1
95-63-61,2,4-Trimethylbenzene 0.50 U 135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-61,3-Dichlorobenzene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8		0.50	τī
135-98-8sec-Butylbenzene 0.50 U 541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U			
541-73-11,3-Dichlorobenzene 0.50 U 99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8			
99-87-64-Isopropyltoluene 0.50 U 106-46-71,4-Dichlorobenzene 0.50 U 104-51-8Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3			
106-46-71,4-Dichlorobenzene 0.50 U 104-51-8			_
104-51-8n-Butylbenzene 0.50 U 95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3	106-46-71 4-Dichlorobenzene		_
95-50-11,2-Dichlorobenzene 0.50 U 96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3			-
96-12-81,2-Dibromo-3-chloropropane 0.50 U 120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U			
120-82-11,2,4-Trichlorobenzene 0.50 U 87-68-3Hexachlorobutadiene 0.50 U 91-20-3Naphthalene 0.50 U			
87-68-3			
91-20-3Naphthalene 0.50 U			1
			i .
87-61-61,2,3-Trichlorobenzene0.50 U			-
	87-61-61,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.

TW177

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-21

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4447

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

, Q

EPA SAMPLE NO.

TW177

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-21

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4447

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

Lab Name: MITKEM CORP. Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER Lab Sample ID: E0476-22

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4448

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

		~
75-71-8Dichlorodifluoromethane	0.50	TT
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	_
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	1
75-09-2Methylene Chloride	0.50	_
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.50	1
563-58-61,1-Dichloropropene	0.50	1
79-01-6Trichloroethene	0.50	
78-87-51,2-Dichloropropane	0.50	
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	Ū
127-18-4Tetrachloroethene	0.50	U
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	U
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	

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EPA SAMPLE NO.

TW178

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-22

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4448

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. __

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

Q

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

1		
630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6Styrene 100-42-5Styrene 75-25-2Bromoform 98-82-8Isopropylbenzene 79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene 96-18-4	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	מממממממממממממממ
106-43-44-Chlorotoluene 98-06-6tert-Butylbenzene	0.50 0.50	Ŭ U
135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene	0.50 0.50	U U
106-46-71,4-Dichlorobenzene		U U
120-82-11,2,4-Trichlorobenzene 87-68-3Hexachlorobutadiene 91-20-3Naphthalene 87-61-61,2,3-Trichlorobenzene	0.50 0.50 0.50 0.50	U U

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FORM I VOA

EPA SAMPLE NO.

TW179

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4449

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

CAS NO.

Date Analyzed: 04/08/98

Lab Sample ID: E0476-23

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

		. 3, =	~
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	
75-01-4	Vinyl Chloride	0.50	1
74-83-9	Bromomethane	0.50	-
	Chloroethane	0.50	
75-69-4	Trichlorofluoromethane	0.50	
75-35-4	1,1-Dichloroethene	0.50	
75-09-2	Methylene Chloride	0.50	
	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	i
75-34-3	1,1-Dichloroethane	0.50	
156-59-2	cis-1,2-Dichloroethene	0.50	
590-20-7	2,2-Dichloropropane	0.50	1 -
107-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
67-66-3		0.50	
	Carbon Tetrachloride	0.50	
71-55-6	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	
71-43-2	Benzene	0.50	
	Dibromomethane	0.50	
75-27-4	Bromodichloromethane	0.50	
10061-01-5	cis-1,3-Dichloropropene	0.50	
108-88-3	Toluene	0.50	
	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	
127-18-4	Tetrachloroethene	0.50	
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	
106-93-4	1,2-Dibromoethane	0.50	
108-90-7	Chlorobenzene	0.50	
		0.50	
· · · · · · · · · · · · · · · · · · ·		l	l

FORM I VOA

EPA SAMPLE NO.

TW179

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-23

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4449

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

Q

1			
630-20-61,1,1,2-Tetrach	loroethane	0.50	TT T
100-41-4Ethylbenzene	—	0.50	1 -
136777-61-2m,p-Xylene		0.50	_
95-47-6O-Xylene		0.50	_
100-42-5Styrene		0.50	
75-25-2Bromoform		0.50	
98-82-8Isopropylbenzer	<u> </u>	0.50	-
		0.50	_
79-34-51,1,2,2-Tetrach			-
108-86-1Bromobenzene		0.50	_
96-18-41,2,3-Trichlord		0.50	~
103-65-1n-Propylbenzene		0.50	4 ⁻
95-49-82-Chlorotoluene		0.50	-
108-67-81,3,5-Trimethy		0.50	
106-43-44-Chlorotoluene		0.50	-
98-06-6tert-Butylbenze		0.50	1 -
95-63-61,2,4-Trimethy		0.50	U
135-98-8sec-Butylbenzer		0.50	U
541-73-11,3-Dichlorober		0.50	U
99-87-64-Isopropyltoli	iene	0.50	U
106-46-71,4-Dichlorober	ızene	0.50	U
104-51-8n-Butylbenzene		0.50	υ
95-50-11,2-Dichlorober	izene	0.50	ע ע
96-12-81,2-Dibromo-3-c		0.50	TO ST
120-82-11,2,4-Trichlord		0.50	
87-68-3Hexachlorobutac		0.50	U
91-20-3Naphthalene		0.50	U
87-61-61,2,3-Trichlord	benzene	0.50	שו
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FORM I VOA

EPA SAMPLE NO.

TW180

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-24

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4450

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: COMPOUND

(ug/L or ug/Kg) UG/L

Q

		1
75-71-8Dichlorodifluoromethane	0.50	
74-87-3Chloromethane	0.50	
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	J
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	1
75-09-2Methylene Chloride	0.50	
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	į
75-34-31,1-Dichloroethane	0.50	
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane		ال
74-97-5Bromochloromethane	2.4 0.50	77
67-66-3Chloroform		
56-23-5Carbon Tetrachloride	0.50	
71-55-61,1,1-Trichloroethane	0.50	^U ¬
563-58-61,1-Dichloropropene	0.86	ر
79-01-6Trichloroethene	0.50	Ū
78-87-51,2-Dichloropropane	2.5	
71-43-2Benzene	0.50	
74-95-3Dibromomethane	0.50	
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	U
127-18-4Tetrachloroethene	0.80	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	U

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FORM I VOA

EPA SAMPLE NO.

TW180

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4450

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

CAS NO.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Lab Sample ID: E0476-24

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50 U
100-41-4Ethylbenzene	0.50 U
136777-61-2m,p-Xylene	0.50 U
95-47-6o-Xylene	0.50 U
100-42-5Styrene	0.50 U
75-25-2Bromoform	0.50 U
98-82-8Isopropylbenzene	0.50 1
79-34-51,1,2,2-Tetrachloroethane	0.50 U
108-86-1Bromobenzene	0.50 0
96-18-41,2,3-Trichloropropane	0.50 U
103-65-1n-Propylbenzene	0.50 U
95-49-82-Chlorotoluene	0.50 U
108-67-81,3,5-Trimethylbenzene	0.50 U
106-43-44-Chlorotoluene	0.50 U
98-06-6tert-Butylbenzene	0.50 U
95-63-61,2,4-Trimethylbenzene	0.50 บ
135-98-8sec-Butylbenzene	0.50 บ
541-73-11,3-Dichlorobenzene	0.50 U
99-87-64-Isopropyltoluene	0.50 บ
106-46-71,4-Dichlorobenzene	0.50 U
104-51-8n-Butylbenzene	0.50 U
95-50-11,2-Dichlorobenzene	0.50 U
96-12-81,2-Dibromo-3-chloropropane	0.50 XT K
120-82-11,2,4-Trichlorobenzene	0.50 ບໍ່
87-68-3Hexachlorobutadiene	0.50 U
91-20-3Naphthalene	0.50 U
87-61-61,2,3-Trichlorobenzene	0.50 U

EPA SAMPLE NO.

		TW181
Lab Name: MITKEM CORP.	Contract:	

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER Lab Sample ID: E0476-25

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4451

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

1		3/1(g/ 00/L	×
75-71-8	Dichlorodifluoromethane	0.50	TT
74-87-3	Chloromethane	0.50	
75-01-4	Vinyl Chloride	0.50	_
74-83-9	Bromomethane	0.50	
75-00-3	Chloroethane	- 0.50	
75-69-4	Trichlorofluoromethane	0.50	_
75-35-4	1,1-Dichloroethene	0.50	
75-09-2	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	1
75-34-3	1,1-Dichloroethane	0.50	
156-59-2	cis-1,2-Dichloroethene	0.50	
590-20-7	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	
74-97 - 5	Bromochloromethane	0.50	
67-66-3 -	Chloroform	0.50	
56-23-5	Carbon Tetrachloride	0.50	
71-55-6	1,1,1-Trichloroethane	1.1	J
563-58-6	1,1-Dichloropropene	0.50	Ū
79-01-6	Trichloroethene	0.68	
78-87-5	1,2-Dichloropropane	0.50	Ū
71-43-2	Benzene	0.50	U
74-95-3 -	Dibromomethane	0.50	U
75-27 - 4	Bromodichloromethane	0.50	
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	
10061-02-6	trans-1,3-Dichloropropene_	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	17	
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	
106-93-4	1,2-Dibromoethane	0.50	
108-90-7	Chlorobenzene	0.50	U

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FORM I VOA

OLMO3.0

EPA SAMPLE NO.

Date Received: 04/07/98

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-25

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4451

% Moisture: not dec. _____ Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

LOW

Level: (low/med)

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:
S NO. COMPOUND (ug/L or ug/Kg) UG/L

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

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FORM I VOA

EPA SAMPLE NO.

TW182

Lab Name: MITKEM CORP.

Contract:

Case No.:

SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-26

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID: V2B4452

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. ___

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	I
	Vinyl Chloride	0.50	1
	Bromomethane	0.50	_
	Chloroethane	0.50	_
	Trichlorofluoromethane	0.50	-
75-35-4	1,1-Dichloroethene	0.50	-
	Methylene Chloride	0.50	-
	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
	1,1-Dichloroethane	0.50	
156-59-2	cis-1,2-Dichloroethene	0.50	
590-20-7	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	ŧ
74-97-5	Bromochloromethane	0.50	-
	Chloroform		-
	Carbon Tetrachloride	0.50	_
30-23-3	carbon retrachioride	0.50	
/1-55-6	1,1,1-Trichloroethane	0.50	i
563-58-6	1,1-Dichloropropene	0.50	
/9-01-6	Trichloroethene	0.50	_
	1,2-Dichloropropane	0.50	_
71-43-2		0.50	_
	Dibromomethane	0.50	-
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	Ŭ -
108-88-3		0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	_
79-00-5 -	1,1,2-Trichloroethane	0.50	Ū
	Tetrachloroethene	0.50	U
	1,3-Dichloropropane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
	1,2-Dibromoethane	0.50	_
108-90-7	Chlorobenzene	0.50	
		•	

FORM I VOA

EPA SAMPLE NO.

TW182	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-26

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4452

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

FORM I VOA

EPA SAMPLE NO.

TW183

Lab Name: MITKEM CORP.

Contract:

Case No.: Lab Code: MITKEM

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-27

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4453

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

		T	+
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	
75-01-4	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	_
	Trichlorofluoromethane	0.50	I
	1,1-Dichloroethene	0.50	1
75-09-2	Methylene Chloride	0.50	1 '
156-60-5	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	1
	1,1-Dichloroethane	0.50	
156-59-2	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	1
107-06-2	1,2-Dichloroethane	0.50	_
74-97-5	Bromochloromethane	0.50	
	Chloroform		
	Carbon Tetrachloride	0.50	
71 55 6	1,1,1-Trichloroethane	0.50	
71-33-6	1 1 Dishlessessesses	0.50	
70 01 6	1,1-Dichloropropene	0.50	1 -
79-01-6	Trichioroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	
71-43-2		0.50	1
	Dibromomethane	0.50	_
75-27-4	Bromodichloromethane	0.50	
10061-01-5	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
10061-02-6	trans-1,3-Dichloropropene_	0.50	
	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.50	
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	
	1,2-Dibromoethane	0.50	U
108-90-7	Chlorobenzene	0.50	U

FORM I VOA

OLMO3.0

EPA SAMPLE NO.

TW183

Lab Name: MITKEM CORP.

Lab Code: MITKEM

Contract:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-27

Sample wt/vol: 25.00 (q/mL) ML

Case No.:

Lab File ID: V2B4453

Level:

(low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

0.50 U

Q

CONCENTRATION UNITS:

CAS NO.

COMPOUND

100-41-4-----Ethylbenzene

136777-61-2----m,p-Xylene____95-47-6-----o-Xylene____

108-86-1-----Bromobenzene

98-82-8-----Isopropylbenzene

103-65-1----n-Propylbenzene

95-49-8-----2-Chlorotoluene

106-43-4----4-Chlorotoluene

135-98-8----sec-Butylbenzene

104-51-8----n-Butylbenzene

91-20-3-----Naphthalene

541-73-1----1,3-Dichlorobenzene_

106-46-7----1,4-Dichlorobenzene

95-50-1-----1,2-Dichlorobenzene

87-68-3-----Hexachlorobutadiene

87-61-6-----1,2,3-Trichlorobenzene

96-12-8----1, 2-Dibromo-3-chloropropane 120-82-1-----1,2,4-Trichlorobenzene

99-87-6----4-Isopropyltoluene_

98-06-6----tert-Butylbenzene

100-42-5----Styrene_

75-25-2-----Bromoform

630-20-6-----1,1,1,2-Tetrachloroethane

79-34-5----1,1,2,2-Tetrachloroethane

96-18-4----1, 2, 3-Trichloropropane

108-67-8-----1,3,5-Trimethylbenzene

95-63-6----1,2,4-Trimethylbenzene

(ug/L or ug/Kg) UG/L

0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U 0.50 U

> 0.50 U 0.50 U

0.50 U

0.50 U

0.50 U

0.50 U

0.50 0 8

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EPA SAMPLE NO.

TW184

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4454

Level:

(low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

Lab Sample ID: E0476-28

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50	U
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
	Bromomethane	0.50	_
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	i
1634-04-4	Methyl tert-butyl ether	0.50	1 -
75-34-3	1,1-Dichloroethane	0.50	
156-59-2	cis-1,2-Dichloroethene	0.50	1
590-20-7	2,2-Dichloropropane	0.50	
107-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
67-66-3	Chloroform	0.50	
56-23-5	Carbon Tetrachloride	0.50	
71-55-6	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	_
78-87-5	1,2-Dichloropropane	0.50	3 -
71-43-2	Benzene	0.50	1
	Dibromomethane	0.50	-
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3	Toluene	0.50	
	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	
127-18-4	Tetrachloroethene	0.50	
142-28-9	1,3-Dichloropropane	0.50	
	Dibromochloromethane	0.50	
	1,2-Dibromoethane	0.50	
	Chlorobenzene	0.50	
100 70-1	CHIOLODGHZGHG	0.50	١٠
			l
		4 4	

FORM I VOA

EPA SAMPLE NO.

TW184

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4454

Level:

(low/med) LOW

Date Received: 04/07/98

Lab Sample ID: E0476-28

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

1		
630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	1
	0.50	_
136777-61-2m,p-Xylene		
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	1 -
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	-
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	υ
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U ,
96-12-81,2-Dibromo-3-chloropropane	0.50	IN K
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	lυ
		·

EPA SAMPLE NO.

TW36

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-29

Sample wt/vol:

25.00 (q/mL) ML

Lab File ID: V2B4455

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

	(ug/11 01 0	.5,5,,	*
75-71-8	Dichlorodifluoromethane	0.50	TT
74-87-3	Chloromethane	0.50	
	Vinyl Chloride	- 0.50 0.50	
74-83-9	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
75-35-4	1,1-Dichloroethene	- 0.50 0.50	
75-09-2	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	-\ 0.50 0.50	
75-34-3	1,1-Dichloroethane	- 0.50 0.50	
156-59-2	cis-1,2-Dichloroethene	- 0.50 0.50	
590-20-7	2,2-Dichloropropane	- 0.50 0.50	
107-06-2	1,2-Dichloroethane	0.50	
74-97-5	Bromochloromethane	0.50	
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
71-55-6	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	-\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
78-87-5	1,2-Dichloropropane	0.50	
71-43-2	Benzene	0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	- 0.50 0.50	
10061-01-5	cis-1,3-Dichloropropene	0.50	
108-88-3	Toluene	0.50	
	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.50	
142-28-9	1,3-Dichloropropane	0.50	
124-48-1	Dibromochloromethane	0.50	
106-93-4	1,2-Dibromoethane	- 0.50	
108-90-7	Chlorobenzene	0.50	
		- ""	

EPA SAMPLE NO.

TW36

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-29

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4455

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. __

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: (uL)

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
136777-61-2	1	_
95-47-6o-Xylene	0.50	-
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	•
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	U
108-86-1Bromobenzene	0.50	U
96-18-41,2,3-Trichloropropane	0.50	U
103-65-1n-Propylbenzene	0.50	U
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	IJ
95-63-61,2,4-Trimethylbenzene	0.50	_
135-98-8sec-Butylbenzene	0.50	
541-73-11,3-Dichlorobenzene	1	
99-87-64-Isopropyltoluene	0.50	-
106-46-71,4-Dichlorobenzene	(
104-51-8n-Butylbenzene	0.50	_
95-50-11,2-Dichlorobenzene	0.50	_
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	TT (N
87-68-3Hexachlorobutadiene	0.50	
	1	_
91-20-3Naphthalene	0.50	_
87-61-61,2,3-Trichlorobenzene	0.50	Ū

EPA SAMPLE NO.

TW250

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-30

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4456

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

		T	· · · · · · · · · · · · · · · · · · ·
75-71-8	Dichlorodifluoromethane	0.50	TT
	Chloromethane	0.50	
	Vinyl Chloride	0.50	1
	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	_
75-09-2	Methylene Chloride	0.50	
156-60-5	trans-1,2-Dichloroethene	1	_
1624-04-4	Methyl tert-butyl ether	0.50	1 -
		0.50	1 -
156 50 0	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	_
590-20-7	2,2-Dichloropropane	0.50	
10/-06-2	1,2-Dichloroethane	0.50	
/4-9/-5	Bromochloromethane	0.50	
67-66-3	Chloroform	0.50	
56-23-5	Carbon Tetrachloride	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
78-87-5	1,2-Dichloropropane	0.50	U
71-43-2		0.50	U
	Dibromomethane	0.50	
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
108-88-3	Toluene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
142-28-9	1,3-Dichloropropane	0.50	U
124-48-1	Dibromochloromethane	0.50	U
	1,2-Dibromoethane	0.50	-
	Chlorobenzene	0.50	
		0.50	-

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FORM I VOA

EPA SAMPLE NO.

TW 250	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-30

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4456

Level: (low/med) LOW

Date Received: 04/07/98

Date Analyzed: 04/08/98

% Moisture: not dec. _____

CAS NO.

Soil Extract Volume: (uL)

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

COMPOUND

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6Styrene 100-42-5Bromoform 98-82-8Isopropylbenzene 79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene 96-18-41,2,3-Trichloropropane 103-65-1	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	ממממממממממממממ
108-86-1Bromobenzene		_
	*	_
95-49-82-Chlorotoluene	0.50	Ū
106-43-44-Chlorotoluene	0.50	Ü
95-63-61,2,4-Trimethylbenzene		_
135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene		U U
99-87-64-Isopropyltoluene 106-46-71,4-Dichlorobenzene	0.50 0.50	
104-51-8n-Butylbenzene 95-50-11,2-Dichlorobenzene	0.50	U
96-12-81,2-Dibromo-3-chloropropane	0.50	ΨK
120-82-11,2,4-Trichlorobenzene 87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene 87-61-61,2,3-Trichlorobenzene	0.50 0.50	U

FORM I VOA

EPA SAMPLE NO.

SDG No.: E0476

TW251

Lab Name: MITKEM CORP.

Contract:

SAS No.:

Lab Code: MITKEM Case No.:

Matrix: (soil/water) WATER

Lab Sample ID: E0476-31

Sample wt/vol: 25.00 (g/mL) MLLab File ID: V2B4457

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: ____(uL)

> CONCENTRATION UNITS: COMPOUND

CAS NO. (ug/L or ug/Kq) UG/L 0

(49/11 01 49/19	,, 00, H Q
75-71-8Dichlorodifluoromethane	4.2
74-87-3Chloromethane	0.50 0
75-01-4Vinyl Chloride	0.50 U
74-83-9Bromomethane	0.50 U
75-00-3Chloroethane	0.50 U
75-69-4Trichlorofluoromethane	0.94
75-35-41,1-Dichloroethene	1.1
75-09-2Methylene Chloride	0.50 U
156-60-5trans-1,2-Dichloroethene	0.50 U
1634-04-4Methyl tert-butyl ether	0.50 U
75-34-31,1-Dichloroethane	2.6
156-59-2cis-1,2-Dichloroethene	3.5
590-20-72,2-Dichloropropane	0.50 U
107-06-21,2-Dichloroethane	0.50 U
74-97-5Bromochloromethane	0.50 ปี
67-66-3Chloroform	0.50 U
56-23-5Carbon Tetrachloride	0.50 U
71-55-61,1,1-Trichloroethane	3.7
563-58-61,1-Dichloropropene	0.50 0
79-01-6Trichloroethene	1.0
78-87-51,2-Dichloropropane	0.50 0
71-43-2Benzene	0.50 U
74-95-3Dibromomethane	0.50 บ
75-27-4Bromodichloromethane	0.50 บ
10061-01-5cis-1,3-Dichloropropene	0.50 U
108-88-3Toluene	0.50 บ
10061-02-6trans-1,3-Dichloropropene	0.50 U
79-00-51,1,2-Trichloroethane	0.50 U
127-18-4Tetrachloroethene	12
142-28-91,3-Dichloropropane	0.50 U
124-48-1Dibromochloromethane	0.50 U
106-93-41,2-Dibromoethane	0.50 U
108-90-7Chlorobenzene	0.50 U
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FORM I VOA

EPA SAMPLE NO.

TW251

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4457

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

Lab Sample ID: E0476-31

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

	<u> </u>	
630-20-61,1,1,2-Tetrachloroethane	0.50	тт
100-41-4Ethylbenzene	0.50	-
136777-61-2m,p-Xylene	0.50	
95-47-6	0.50	-
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene	0.50	-
79-34-51,1,2,2-Tetrachloroethane	0.50	-
108-86-1Bromobenzene	1 1	
	0.50	
96-18-41,2,3-Trichloropropane		
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	_
95-63-61,2,4-Trimethylbenzene	0.50	-
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U.
95-50-11,2-Dichlorobenzene	0.50	U
96-12-81,2-Dibromo-3-chloropropane	0.50	U-R
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	1
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EPA SAMPLE NO.

TW252

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-32

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

LOW

V2B4561

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

Q

75-71-8				
75-01-4	75-71-8	Dichlorodifluoromethane		
74-83-9Bromomethane 0.50 U 75-00-3Chloroethane 0.50 U 75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2				U
75-00-3	75-01-4	Vinyl Chloride	0.50	Ū
75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5	74-83-9	Bromomethane	0.50	U
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 74-95-3Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 122-28-91,1,2-Trichloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U			0.50	U
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 74-95-3Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 122-28-91,1,2-Trichloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U	75-69-4	Trichlorofluoromethane	0.50	U
75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 79-01-6Trichloroethene 0.50 U 79-01-6Trichloroethene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Benzene 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6	75-35-4	1,1-Dichloroethene	0.50	U
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloroethane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4	75-09-2	Methylene Chloride	1	_
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 66-3Chloroform 0.50 U 56-23-5			1	
75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-5Benzene 0.50 U 74-95-3Bromodichloromethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 10061-02-6			1	-
156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane. 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U 122-18-4Dibromochloromethane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U				
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67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5I,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	74-97-5	Promochloromothano	1	_
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71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	79-01-6	Trichloroethene	1	
74-95-3	78-87-5	1,2-Dichloropropane	1	-
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108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	75-27-4	Bromodichloromethane	0.50	Ŭ
10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	10061-01-5	cis-1,3-Dichloropropene_	0.50	U
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			0.50	U
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	10061-02-6	trans-1,3-Dichloropropene	0.50	U
127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	79-00-5	1,1,2-Trichloroethane	0.50	U
142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	127-18-4	Tetrachloroethene	0.50	U
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	142-28-9	1,3-Dichloropropane	1 ' ' 1	Ū
106-93-41,2-Dibromoethane 0.50 U	124-48-1	Dibromochloromethane	1	-
108-90-7Chlorobenzene 0.50 U	106-93-4	1,2-Dibromoethane		-
0.30	108-90-7	Chlorobenzene	1	•
				•

FORM I VOA

EPA SAMPLE NO.

TW252

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-32

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4561

Level: (low/med)

LOW

Soil Extract Volume: ____(uL)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50 U
100-41-4Ethylbenzene	0.50 U
136777-61-2m,p-Xylene	0.50 U
95-47-6o-Xylene	0.50
100-42-5Styrene	0.50 0
75-25-2Bromoform	0.50
98-82-8Isopropylbenzene	0.50 0
79-34-51,1,2,2-Tetrachloroethane	0.50 0
108-86-1Bromobenzene	
96-18-41,2,3-Trichloropropane	0.50 U
100 CF 1	0.50 U
103-65-1n-Propylbenzene	0.50 U
95-49-82-Chlorotoluene	0.50 U
108-67-81,3,5-Trimethylbenzene	0.50 U
106-43-44-Chlorotoluene	0.50 U
98-06-6tert-Butylbenzene	0.50 U
95-63-61,2,4-Trimethylbenzene	0.50 U
135-98-8sec-Butylbenzene	0.50 U
541-73-11,3-Dichlorobenzene	0.50 U
99-87-64-Isopropyltoluene	0.50 U
106-46-71,4-Dichlorobenzene	0.50 U
104-51-8n-Butylbenzene	0.50 U
95-50-11,2-Dichlorobenzene	0.50 U 2
96-12-81,2-Dibromo-3-chloropropane	0.50 せん
120-82-11,2,4-Trichlorobenzene	0.50 U
87-68-3Hexachlorobutadiene	0.50 U
91-20-3Naphthalene	1.5
87-61-61,2,3-Trichlorobenzene	0.50 U
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FORM I VOA

EPA SAMPLE NO.

TW252

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

LOW

Lab Sample ID: E0476-32

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4561

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50 U
100-41-4Ethylbenzene	0.50 U
136777-61-2m,p-Xylene	0.50 U
95-47-6O-Xylene	0.50 U
100-42-5Styrene	
75-25-2Bromoform	0.50 U
	0.50 U
98-82-8Isopropylbenzene	0.50 U
79-34-51,1,2,2-Tetrachloroethane	0.50 U
108-86-1Bromobenzene	0.50 U
96-18-41,2,3-Trichloropropane	0.50 U
103-65-1n-Propylbenzene	0.50 U
95-49-82-Chlorotoluene	0.50 0
108-67-81,3,5-Trimethylbenzene	0.50 U
106-43-44-Chlorotoluene	0.50 U
98-06-6tert-Butylbenzene	0.50 U
95-63-61,2,4-Trimethylbenzene	0.50 U
135-98-8sec-Butylbenzene	0.50 U
541-73-11,3-Dichlorobenzene	0.50 0
99-87-64-Isopropyltoluene	0.50 0
106-46-71,4-Dichlorobenzene	0.50 0
104-51-8n-Butylbenzene	0.50 0
95-50-11,2-Dichlorobenzene	0.50 0
96-12-81,2-Dibromo-3-chloropropane	0.50 PR
120-82-11,2,4-Trichlorobenzene	0.50 U
87-68-3Hexachlorobutadiene	·
91-20-3Naphthalene	0.50
87-61-61,2,3-Trichlorobenzene	1.5
o, or o =====1,2,3=firetinorobelizette	0.50 U
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EPA SAMPLE NO.

TW253

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER Lab Sample ID: E0476-33

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4562

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. ____ Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

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75-71-8	Dichlorodifluoromethane	0.50	TT
	Chloromethane	0.50	-
	Vinyl Chloride	0.50	
74-83-9	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
75-35-4	1,1-Dichloroethene	0.50	_
	Methylene Chloride	0.50	-
	trans-1,2-Dichloroethene	0.50	
1634-04-4	Methyl tert-butyl ether	0.50	-
	1,1-Dichloroethane	0.50	_
	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	
	1,2-Dichloroethane	0.50	
	Bromochloromethane	0.50	
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	_
	1,1-Dichloropropene	0.50	
	Trichloroethene	0.50	
	1,2-Dichloropropane	0.50	
71-43-2		0.50	-
	Dibromomethane	0.50	
	Bromodichloromethane		
	cis-1,3-Dichloropropene		_
108-88-3			
	trans-1,3-Dichloropropene	0.50	
	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.50	
	1,3-Dichloropropane	0.50	
	Dibromochloromethane	0.50	
	1,2-Dibromoethane	0.50	
108-90-7	Chlorobenzene	0.50	Ŭ

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FORM I VOA

EPA SAMPLE NO.

TW253

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-33

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4562

Level: (low/med)

Date Received: 04/07/98

LOW

Date Analyzed: 04/11/98

GC Column: DB-624

% Moisture: not dec.

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	l	
630-20-61,1,1,2-Tetrachloroethane	0.50	тт
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	_
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	_
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	•
108-67-81,3,5-Trimethylbenzene	0.50	-
106-43-44-Chlorotoluene	0.50	Ū
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	Ū
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U 0
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	-
87-61-61,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.

TW254

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-34

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4563

Level: (low/med)

LOW

Case No.:

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume:____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

74-87-3 75-01-4 75-00-3 75-69-4 75-35-4 156-60-5 156-59-2 156-59-2 107-06-2 74-97-5 56-23-5 71-55-6 78-87-5 78-87-5 71-43-2 74-95-3 75-27-4 108-88-3 108-88-3 10061-02-6	DibromomethaneBromodichloromethanecis-1,3-DichloropropeneToluenetrans-1,3-Dichloropropene	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	ממממממממ ממממממממממממממ
78-87-5 71-43-2 74-95-3 75-27-4 10061-01-5 108-88-3 10061-02-6 79-00-5 127-18-4 142-28-9 124-48-1 106-93-4	1,2-Dichloropropane	0.50 0.50 0.50 0.50 0.50	ט טטטט טטטטט ט

EPA SAMPLE NO.

TW254

Lab Name: MITKEM CORP.

Contract:

SAS No.: Lab Code: MITKEM

Case No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-34

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4563

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

630-20-6	1,1,1,2-Tetrachloroethane	0.50	U
	Ethylbenzene	0.50	lυ
	m,p-Xylene	0.50	lυ
95-47-6 -	o-Xylene	0.50	U
100-42-5		0.50	1
	Bromoform	0.50	Ū
98-82-8	Isopropylbenzene	0.50	1 -
79-34-5	1,1,2,2-Tetrachloroethane	0.50	1 -
108-86-1	Bromobenzene	0.50	1
96-18-4	1,2,3-Trichloropropane	0.50	-
103-65-1	n-Propylbenzene	0.50	lΰ
95-49-8 -	2-Chlorotoluene	0.50	I
108-67-8	1,3,5-Trimethylbenzene	0.50	Ū
106-43-4	4-Chlorotoluene	0.50	-
98-06-6	tert-Butylbenzene	0.50	i -
95-63-6	1,2,4-Trimethylbenzene	0.50	
135-98-8	sec-Butylbenzene	0.50	-
541-73-1	1,3-Dichlorobenzene	0.50	
99-87-6	4-Isopropyltoluene	0.50	1 -
106-46-7	1,4-Dichlorobenzene	0.50	1 -
104-51-8	n-Butylbenzene	0.50	
95-50-1	1,2-Dichlorobenzene	0.50	i -
96-12-8	1,2-Dibromo-3-chloropropane	0.50	1 - /10
120-82-1	1,2,4-Trichlorobenzene	0.50	1
87-68-3	Hexachlorobutadiene	0.50	
	Naphthalene	0.50	
87-61-6	1,2,3-Trichlorobenzene	0.50	_

EPA SAMPLE NO.

TW255

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-35

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4564

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

LOW

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

		
75-71-8Dichlorodifluoromethane	0.50	TT
74-87-3Chloromethane	0.50	_
75-01-4Vinyl Chloride	0.50	
74-83-9Bromomethane	0.50	
75-00-3Chloroethane	0.50	
75-69-4Trichlorofluoromethane	0.50	
75-35-41,1-Dichloroethene	0.50	
75-09-2Methylene Chloride	0.50	-
156-60-5trans-1,2-Dichloroethene	0.50	
1634-04-4Methyl tert-butyl ether	0.50	_
75-34-31,1-Dichloroethane	0.50	-
156-59-2cis-1,2-Dichloroethene	0.50	
590-20-72,2-Dichloropropane	0.50	
107-06-21,2-Dichloroethane	0.50	
74-97-5Bromochloromethane	0.50	
67-66-3Chloroform	0.50	U
56-23-5Carbon Tetrachloride	0.50	υ_
71-55-61,1,1-Trichloroethane	0.88	J
563-58-61,1-Dichloropropene	0.50	ਹ ਹ
79-01-6Trichloroethene	0.50	U .
78-87-51,2-Dichloropropane	0.50	U
71-43-2Benzene	0.50	U
74-95-3Dibromomethane	0.50	U
75-27-4Bromodichloromethane	0.50	U
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	U
79-00-51,1,2-Trichloroethane	0.50	U
127-18-4Tetrachloroethene	3.8	
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	U
	250	

EPA SAMPLE NO.

Lab Name: MITKEM CORP. Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER Lab Sample ID: E0476-35

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4564

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. _____ Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
95-47-6	0.50	_
100-42-5Styrene		_
75-25-2Bromoform	0.50	_
	0.50	_
98-82-8Isopropylbenzene	0.50	_
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	U
103-65-1n-Propylbenzene	0.50	Ū
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	ŢŢ
95-63-61,2,4-Trimethylbenzene	0.50	_
135-98-8sec-Butylbenzene	0.50	
541-73-11,3-Dichlorobenzene	0.50	
99-87-64-Isopropyltoluene	0.50	_
106-46-71,4-Dichlorobenzene	0.50	_
104-51-8n-Butylbenzene	0.50	
95-50-11,2-Dichlorobenzene		
96-12-81,2-Dibromo-3-chloropropane	0.50	
120 02 1 1 2 4 Trichlorobon	0.50	
120-82-11,2,4-Trichlorobenzene 87-68-3Hexachlorobutadiene	0.50	
	0.50	
91-20-3Naphthalene	0.50	•
87-61-61,2,3-Trichlorobenzene	0.50	Ų

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FORM I VOA

EPA SAMPLE NO.

TW256

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-36

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4565

Level: (low/med)

Date Received: 04/07/98

LOW

% Moisture: not dec.

CAS NO.

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

COMPOUND

Date Analyzed: 04/11/98

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50 U
	Chloromethane	- 0.50 U
	Vinyl Chloride	- 0.50 บ
	Bromomethane	- 0.50 บ
	Chloroethane	0.50 0
	Trichlorofluoromethane	0.50 0
	1,1-Dichloroethene	0.50 U
	Methylene Chloride	-) 0.50 U
	trans-1,2-Dichloroethene	0.50 0
	Methyl tert-butyl ether	- 0.50 U
	1,1-Dichloroethane	- 0.93
	cis-1,2-Dichloroethene	-\ 0.50\ \u 0.50\\u 0.
	2,2-Dichloropropane	- 0.50 U
	1,2-Dichloroptopane	0.50 0
	Bromochloromethane	- 0.50 0
	Chloroform	- 0.50 U
	Carbon Tetrachloride	- 0.50 U
	1,1,1-Trichloroethane	- 0.30 T
11-22-6	1,1-Dichloropropene	$0.50 _{\overline{U}}$
70 01 6	Trichloroethene	0.52
	1,2-Dichloropropane	$- \begin{vmatrix} 0.32 \\ 0.50 \end{vmatrix} \overline{U}$
71-43-2		- 0.50 U
	Dibromomethane	0.50 0
	Bromodichloromethane	- 0.50 U
	cis-1,3-Dichloropropene	- 0.50 U
10061-01-5		- 0.50 U
		- 0.50 U
10061-07-6	trans-1,3-Dichloropropene_	_1
	1,1,2-Trichloroethane	-1
	Tetrachloroethene	0.50 U
	1,3-Dichloropropane	0.50 U
	Dibromochloromethane	0.50 U
	1,2-Dibromoethane	0.50 U
108-90-7	Chlorobenzene	0.50 U

EPA SAMPLE NO.

TW256

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-36

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4565

Level:

(low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	_
100-42-5Styrene		
75-25-2Bromoform	0.50	IJ
98-82-8Isopropylbenzene	0.50	IJ
79-34-51,1,2,2-Tetrachloroethane		_
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	_
103-65-1n-Propylbenzene	0.50	U
95-49-82-Chlorotoluene	0.50	_
108-67-81,3,5-Trimethylbenzene		_
		_
106-43-44-Chlorotoluene	0.50	_
98-06-6tert-Butylbenzene	0.50	_
95-63-61,2,4-Trimethylbenzene	0.50	Ū
135-98-8sec-Butylbenzene	0.50	_
541-73-11,3-Dichlorobenzene	0.50	Ŭ
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene		
95-50-11,2-Dichlorobenzene	0.50	
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	_
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.

Lab Name: MITKEM CORP. Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER Lab Sample ID: E0476-37

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4566

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. ____ Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

75-71-8			
74-87-3	75-71-8Dichlorodifluoromethane	0.50	TI
75-01-4			
74-83-9Bromomethane 0.50 U 75-00-3Chloroethane 0.50 U 75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 156-60-5	75-01-4Vinvl Chloride		
75-00-3	74-83-9Bromomethane		
75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5			
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 76-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 79-01-6			
75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 74-95-3Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 10061-02-6			
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloroethane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 1061-01-5	156-60-5trans-1,2-Dichloroethene		
75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5	1634-04-4Methyl tert-butyl ether		
156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	75-34-31,1-Dichloroethane		
590-20-72, 2-Dichloropropane 0.50 U 107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethene 0.50 U 122-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		I .	
74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	56-23-5Carbon Tetrachloride	0.50	U
79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	71-55-61,1,1-Trichloroethane	0.50	U
78-87-51, 2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	563-58-61,1-Dichloropropene	0.50	U
71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
74-95-3		0.50	U
75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		1	
142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
106-93-41,2-Dibromoethane 0.50 U			
108-90-7Chlorobenzene0.50 U			
	108-90-7Chlorobenzene	0.50	U

277

EPA SAMPLE NO.

TW257

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-37

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4566

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	
136777-61-2m,p-Xylene	0.50	
95-47-6	0.50	1
100-42-5Styrene	0.50	1 -
75-25-2Bromoform	0.50	1 -
98-82-8Isopropylbenzene		1 -
	0.50	-
79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene	0.50	_
	0.50	_
96-18-41,2,3-Trichloropropane	0.50	_
103-65-1n-Propylbenzene	0.50	_
95-49-82-Chlorotoluene	0.50	-
108-67-81,3,5-Trimethylbenzene	0.50	•
106-43-44-Chlorotoluene	0.50	-
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	Ū
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	Ū a
96-12-81,2-Dibromo-3-chloropropane	0.50	ET 1
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	_
91-20-3Naphthalene	0.50	1
87-61-61,2,3-Trichlorobenzene	0.50	_
	l 	

EPA SAMPLE NO.

TW258

Lab Name: MITKEM CORP.

Contract:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Code: MITKEM Case No.:

Lab Sample ID: E0476-38

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4567

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

75-71-8			
74-87-3	75-71-8Dichlorodifluoromethane	0.50	IJ
75-01-4			_
74-83-9			
75-00-3Chloroethane 0.50 U 75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-22,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 74-95-3Bromodichloromethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U			
75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloropropane 0.50 U 107-06-21,2-Dichloropropane 0.50 U 107-06-21,2-Dichloromethane 0.50 U 67-66-3Bromochloromethane 0.50 U 67-66-3Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-5Benzene 0.50 U 74-95-3Bromodichloromethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 108-88-3Toluene 0.50 U 109-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-28-91,3-Dichloropropane 0.50 U			
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-3			
75-09-2			
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane 0.50 U 106-93-41,2-Dibromochloromethane	75-09-2Methylene Chloride		_
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 67-66-3Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-6			_
75-34-31,1-Dichloroethane 0.50 U 156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 1061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			_
156-59-2cis-1,2-Dichloroethene 0.50 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			-
590-20-72, 2-Dichloropropane 0.50 U 107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61, 1, 1-Trichloroethane 0.50 U 563-58-61, 1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51, 2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 10061-02-6Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 179-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61, 1, 1-Trichloroethane 0.50 U 563-58-61, 1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51, 2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 10061-01-5Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U 122-8-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 127-18-4Tetrachloroethane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	107-06-21,2-Dichloroethane		
67-66-3		0.50	U
71-55-61,1,1-Trichloroethane 0.50 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	56-23-5Carbon Tetrachloride	0.50	U
563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	563-58-61,1-Dichloropropene .	0.50	U
71-43-2		0.50	U
74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5	78-87-51,2-Dichloropropane	0.50	U
75-27-4		0.50	U
10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
127-18-4Tetrachloroethene 0.50 U 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		,	
142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	142-28-91,3-Dichloropropane	1	
106-93-41,2-Dibromoethane0.50 U	124-48-1Dibromochloromethane		1
108-90-7Chlorobenzene 0.50 U			
	108-90-7Chlorobenzene	0.50	U

EPA SAMPLE NO.

TW258

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4567

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Lab Sample ID: E0476-38

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

630-20-6	1,1,1,2-Tetrachloroethane	0.50 U
	Ethylbenzene	0.50 U
	m,p-Xylene	0.50 U
	o-Xylene	0.50 U
100-42-5		0.50 U
	Bromoform	0.50 U
98-82-8	Isopropylbenzene	0.50 U
	1,1,2,2-Tetrachloroethane	0.50 U
	Bromobenzene	0.50 U
96-18-4	1,2,3-Trichloropropane	0.50 U
103-65-1	n-Propylbenzene	0.50 U
	2-Chlorotoluene	0.50 U
108-67-8	1,3,5-Trimethylbenzene	0.50 U
	4-Chlorotoluene	0.50 U
98-06-6	tert-Butylbenzene	0.50 U
	1,2,4-Trimethylbenzene	0.50 U
135-98-8	sec-Butylbenzene	0.50 U
541-73-1	1,3-Dichlorobenzene	0.50 U
99-87-6	4-Isopropyltoluene	0.50 U
106-46-7	1,4-Dichlorobenzene	0.50 U
104-51-8	n-Butylbenzene	0.50 บ
95-50-1	1,2-Dichlorobenzene	0.50 U A
96-12-8	1,2-Dibromo-3-chloropropane	0.50
120-82-1	1,2,4-Trichlorobenzene	0.50 U
	Hexachlorobutadiene	0.50 U
	Naphthalene	0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.50 บ

EPA SAMPLE NO.

TW259

Lab Name: MITKEM CORP. Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-39

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4568

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND

(ug/L or ug/Kg) UG/L

The second secon	
75-71-8Dichlorodifluoromethane	0.50 U
74-87-3Chloromethane	0.50 U
75-01-4Vinyl Chloride	
74-83-9Bromomethane	0.50 U
75-00-3Chloroethane	0.50 U
	0.50 U
75-69-4Trichlorofluoromethane	0.50 U
75-35-41,1-Dichloroethene	0.50 U
75-09-2Methylene Chloride	0.50 U
156-60-5trans-1,2-Dichloroethene	0.50 U
1634-04-4Methyl tert-butyl ether	0.50 U
75-34-31,1-Dichloroethane	0.50 ប
156-59-2cis-1,2-Dichloroethene	0.50 ប
590-20-72,2-Dichloropropane	0.50 U
107-06-21,2-Dichloroethane	0.50 บ
74-97-5Bromochloromethane	0.50 U
67-66-3Chloroform	0.50 U
56-23-5Carbon Tetrachloride	0.50 U
71-55-61,1,1-Trichloroethane	0.50 U
563-58-61,1-Dichloropropene	0.50 U
79-01-6Trichloroethene	0.50 U
78-87-51,2-Dichloropropane	0.50 U
71-43-2Benzene	0.50 U
74-95-3Dibromomethane	0.50 U
75-27-4Bromodichloromethane	0.50 U
10061-01-5cis-1,3-Dichloropropene	0.50 U
108-88-3Toluene	0.50 U
10061-02-6trans-1,3-Dichloropropene	0.50 U
79-00-51,1,2-Trichloroethane	0.50 U
127-18-4Tetrachloroethene	0.50 U
142-28-91,3-Dichloropropane	0.50 U
124-48-1Dibromochloromethane	0.50 U
106-93-41,2-Dibromoethane	0.50 U
108-90-7Chlorobenzene	0.50 U
	0.04
	-291-

EPA SAMPLE NO.

TW259

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-39

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4568

Level: (low/med) LOW

Date Received: 04/07/98

Date Analyzed: 04/11/98

% Moisture: not dec.

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene 136777-61-2m,p-Xylene 95-47-6Styrene 100-42-5Styrene 75-25-2Bromoform 98-82-8	0.50 0.50
99-87-64-Isopropyltoluene 106-46-71,4-Dichlorobenzene 104-51-8n-Butylbenzene	0.50 U 0.50 U 0.50 U

EPA SAMPLE NO.

TW260

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-40

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4569

Level: (low/med)

Date Received: 04/07/98

LOW

Date Analyzed: 04/11/98

% Moisture: not dec.

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

GC Column: DB-624

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

Q

CAS NO. COMPOUND

108-88-3-----Toluene

10061-02-6----trans-1,3-Dichloropropene

79-00-5----1,1,2-Trichloroethane

127-18-4-----Tetrachloroethene

106-93-4----1,2-Dibromoethane

108-90-7-----Chlorobenzene

142-28-9-----1,3-Dichloropropane

124-48-1-----Dibromochloromethane

		1 , 1	
	75-71-8Dichlorodifluoromethane	0.50 U	
	74-87-3Chloromethane	0.50 U	
	75-01-4Vinyl Chloride	0.50 U	
	74-83-9Bromomethane	0.50 U	
	75-00-3Chloroethane	0.50 U	
	75-69-4Trichlorofluoromethane	0.50lu l	
	75-35-41,1-Dichloroethene	0.50 U	
	75-09-2Methylene Chloride	l 0.50 ʊ	
	156-60-5trans-1,2-Dichloroethene	0.50 U	
į	1634-04-4Methyl tert-butyl ether	0.50 U	
	75-34-31,1-Dichloroethane	0.51	
	156-59-2cis-1,2-Dichloroethene	0.50 U	
	590-20-72,2-Dichloropropane	0.50 U	
	107-06-21,2-Dichloroethane	0.50 U	
	74-97-5Bromochloromethane	0.50 U	
	67-66-3Chloroform	0.50 U	
	56-23-5Carbon Tetrachloride	0.50 U _	
	71-55-61,1,1-Trichloroethane	1.4	
	563-58-61,1-Dichloropropene	0.50 U	
	79-01-6Trichloroethene	0.50 U	
	78-87-51,2-Dichloropropane	0.50 U	
	71-43-2Benzene	0.50 U	
	74-95-3Dibromomethane	0.50 U	
	75-27-4Bromodichloromethane	0.50 U	
	10061-01-5cis-1,3-Dichloropropene	0.50 ซ	

0.50 U

0.50 U

0.50 U

0.50 U

0.50

0.50

0.50

U

U

U 0.50 U

EPA SAMPLE NO.

TW260

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-40

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4569

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	•	
630-20-61,1,1,2-Tetrachloroethane	0.50	TT
100-41-4Ethylbenzene	0.50	_
136777-61-2m,p-Xylene		1 -
95-47-6o-Xylene	0.50	-
100-42-5Styrene	0.50	
	0.50	-
75-25-2Bromoform	0.50	_
98-82-8Isopropylbenzene	0.50	-
79-34-51,1,2,2-Tetrachloroethane	0.50	-
108-86-1Bromobenzene	0.50	U
96-18-41,2,3-Trichloropropane	0.50	U
103-65-1n-Propylbenzene	0.50	Ū
95-49-82-Chlorotoluene	0.50	U
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	-
99-87-64-Isopropyltoluene	0.50	
106-46-71,4-Dichlorobenzene	0.50	_
104-51-8n-Butylbenzene	0.50	_
95-50-11,2-Dichlorobenzene	0.50	_
96-12-81,2-Dibromo-3-chloropropane	0.50	- //
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	
1,2,3 IIICIIIOIODCIIZEIIE	0.50	U
	ll	

EPA SAMPLE NO.

TW261

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-41

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4570

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8			
75-01-4	75-71-8Dichlorodifluoromethane	0.50	ט
74-83-9	74-87-3Chloromethane	0.50	Ū
74-83-9	75-01-4Vinvl Chloride	0.50	Ū
75-00-3			
75-69-4Trichlorofluoromethane 0.50 U 75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5	75-00-3Chloroethane		
75-35-41,1-Dichloroethene 0.50 U 75-09-2Methylene Chloride 0.50 U 156-60-5			
75-09-2			~ I
156-60-5trans-1,2-Dichloroethene 0.50 U 1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.65 U 156-59-2cis-1,2-Dichloropropane 0.93 U 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 1.3 I 79-01-6Trichloroethene 0.50 U 79-01-6Trichloroethene 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 108-88-3Toluene 0.50 U 1061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 1.8 127-18-4Tetrachloroethene 1.8 124-48-1Dibromochloromethane 0.50 U <t< td=""><td></td><td></td><td>Ŭ l</td></t<>			Ŭ l
1634-04-4Methyl tert-butyl ether 0.50 U 75-34-31,1-Dichloroethane 0.65 156-59-2cis-1,2-Dichloroethene 0.93 590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1-Trichloroethane 1.3 J 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 1061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 1061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			ŪΙ
75-34-31,1-Dichloroethane 0.65 156-59-2cis-1,2-Dichloroethene 0.93 590-20-72,2-Dichloropropane 0.50 107-06-21,2-Dichloroethane 0.50 74-97-5Bromochloromethane 0.50 67-66-3Chloroform 0.50 56-23-5Carbon Tetrachloride 0.50 71-55-61,1,1-Trichloroethane 1.3 563-58-61,1-Dichloropropene 0.50 79-01-6Trichloroethene 0.54 78-87-51,2-Dichloropropane 0.50 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 1061-01-5cis-1,3-Dichloropropene 0.50 108-88-3Toluene 0.50 10061-02-6trans-1,3-Dichloropropene 0.50 79-00-51,1,2-Trichloroethane 0.50 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 124-48-1Dibromochloromethane 0.50 106-93-41,2-Dibromoethane 0.50			υΙ
156-59-2cis-1,2-Dichloroethene 0.93 590-20-72,2-Dichloropropane 0.50 107-06-21,2-Dichloroethane 0.50 74-97-5Bromochloromethane 0.50 67-66-3Chloroform 0.50 56-23-5Carbon Tetrachloride 0.50 71-55-61,1,1-Trichloroethane 1.3 563-58-61,1-Dichloropropene 0.50 79-01-6Trichloroethene 0.54 78-87-51,2-Dichloropropane 0.50 71-43-2Benzene 0.50 74-95-3Dibromomethane 0.50 10061-01-5cis-1,3-Dichloropropene 0.50 108-88-3Toluene 0.50 10061-02-6trans-1,3-Dichloropropene 0.50 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 124-48-1Dibromochloromethane 0.50 106-93-41,2-Dibromoethane 0.50			
590-20-72,2-Dichloropropane 0.50 U 107-06-21,2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 1.3 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethane 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 1061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
107-06-21, 2-Dichloroethane 0.50 U 74-97-5Bromochloromethane 0.50 U 67-66-3Chloroform 0.50 U 56-23-5Carbon Tetrachloride 0.50 U 71-55-61,1,1-Trichloroethane 1.3 U 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.50 U 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 1061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 1.8 127-18-4Tetrachloroethene 1.8 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		1.	u
74-97-5		0.50	υl
56-23-5		0.50	ט
71-55-61,1-1-Trichloroethane 1.3 I 563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.54 0.54 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 0.50 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	67-66-3Chloroform	0.50	ט ו
563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.54 0.50 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 0.50 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	56-23-5Carbon Tetrachloride	0.50	ט
563-58-61,1-Dichloropropene 0.50 U 79-01-6Trichloroethene 0.54 0.50 78-87-51,2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 0.50 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	71-55-61,1,1-Trichloroethane	1.3	7
78-87-51, 2-Dichloropropane 0.50 U 71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
71-43-2Benzene 0.50 U 74-95-3Dibromomethane 0.50 U 75-27-4Bromodichloromethane 0.50 U 10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	79-01-6Trichloroethene	0.54	
74-95-3	78-87-51,2-Dichloropropane	0.50	Ū
75-27-4	71-43-2Benzene		
10061-01-5cis-1,3-Dichloropropene 0.50 U 108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	74-95-3Dibromomethane		
108-88-3Toluene 0.50 U 10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
10061-02-6trans-1,3-Dichloropropene 0.50 U 79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
79-00-51,1,2-Trichloroethane 0.50 U 127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U			
127-18-4Tetrachloroethene 1.8 142-28-91,3-Dichloropropane 0.50 124-48-1Dibromochloromethane 0.50 106-93-41,2-Dibromoethane 0.50	10061-02-6trans-1,3-Dichloropropene		
142-28-91,3-Dichloropropane 0.50 U 124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U		0.50	U
124-48-1Dibromochloromethane 0.50 U 106-93-41,2-Dibromoethane 0.50 U	127-18-4Tetrachloroethene	1 1.	
106-93-41,2-Dibromoethane 0.50 U	142-28-91,3-Dichloropropane	0.50	Ū
	124-48-1Dibromochloromethane	0.50	บ
108-90-7Chlorobenzene 0.50 U	106-93-41,2-Dibromoethane	0.50	บ
	108-90-7Chlorobenzene	0.50	U

EPA SAMPLE NO.

TW261

Lab Name: MITKEM CORP.

Contract:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Code: MITKEM

SAS No.:

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4570

LOW

Case No.:

Level: (low/med)

Date Received: 04/07/98

Lab Sample ID: E0476-41

% Moisture: not dec. _____

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	U
100-41-4Ethylbenzene	0.50	Ū
136777-61-2m,p-Xylene	0.50	_
95-47-6o-Xylene	0.50	Ū
100-42-5Styrene	0.50	
75-25-2Bromoform	0.50	_
98-82-8Isopropylbenzene	0.50	-
79-34-51,1,2,2-Tetrachloroethane	0.50	Ū
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	Ū
95-49-82-Chlorotoluene	0.50	Ū
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	Ū
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	Ŭ
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	Ū
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U a
96-12-81,2-Dibromo-3-chloropropane	0.50	U-K
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	U
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U
	• • • • • • • • • • • • • • • • • • • •	

EPA SAMPLE NO.

TW262

Lab Name: MITKEM CORP.

Lab Code: MITKEM

Contract:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-42

Sample wt/vol: 25.00 (g/mL) ML

Case No.:

Lab File ID: V2B4571

Level:

(low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L Q

CAS NO. COMPOUND 75-71-8-----Dichlorodifluoromethane 0.50 U 74-87-3-----Chloromethane 0.50 U 75-01-4-----Vinyl Chloride 0.50 U 74-83-9-----Bromomethane 0.50 U 75-00-3-----Chloroethane 0.50 U 75-69-4----Trichlorofluoromethane 0.50 U 75-35-4----1,1-Dichloroethene 0.50 U 75-09-2-----Methylene Chloride 0.50 U 156-60-5----trans-1,2-Dichloroethene 0.50 U 1634-04-4-----Methyl tert-butyl ether 0.50 U 75-34-3----1,1-Dichloroethane 0.50 U 156-59-2----cis-1,2-Dichloroethene 0.50 U 590-20-7----2, 2-Dichloropropane 0.50 U 107-06-2----1, 2-Dichloroethane 0.50 U 74-97-5-----Bromochloromethane 0.50 U 67-66-3-----Chloroform 0.50 U 56-23-5-----Carbon Tetrachloride 0.50 U 71-55-6-----1,1,1-Trichloroethane 0.93 563-58-6----1,1-Dichloropropene 0.50 U 79-01-6-----Trichloroethene 0.89 78-87-5----1,2-Dichloropropane 0.50 U 71-43-2----Benzene 0.50 U 74-95-3-----Dibromomethane 0.50 U 75-27-4-----Bromodichloromethane 0.50 U 10061-01-5----cis-1,3-Dichloropropene 0.50 U 108-88-3-----Toluene 0.50 U 10061-02-6----trans-1,3-Dichloropropene 0.50 U 79-00-5----1,1,2-Trichloroethane 0.50 U 127-18-4----Tetrachloroethene 0.50 U 142-28-9-----1,3-Dichloropropane 0.50 U 124-48-1-----Dibromochloromethane 0.50 U 106-93-4----1,2-Dibromoethane 0.50 U 108-90-7-----Chlorobenzene 0.50 U

EPA SAMPLE NO.

TW262

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-42

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4571

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane 100-41-4Ethylbenzene	0.50 0.50	Ū
136777-61-2m,p-Xylene 95-47-6	0.50 0.50 0.50 0.50	บ บ
98-82-8Isopropylbenzene 79-34-51,1,2,2-Tetrachloroethane 108-86-1Bromobenzene 96-18-41,2,3-Trichloropropane	0.50 0.50 0.50 0.50	บ บ
103-65-1	0.50 0.50 0.50 0.50	บ บ บ
98-06-6tert-Butylbenzene 95-63-61,2,4-Trimethylbenzene 135-98-8sec-Butylbenzene 541-73-11,3-Dichlorobenzene	0.50 0.50 0.50 0.50	U U U
99-87-61,4-Dichlorobenzene 106-46-71,4-Dichlorobenzene 104-51-8Butylbenzene 95-50-11,2-Dichlorobenzene	0.50 0.50 0.50 0.50	U U U
96-12-81,2-Dibromo-3-chloropropane 120-82-11,2,4-Trichlorobenzene 87-68-3Hexachlorobutadiene 91-20-3Naphthalene	0.50 0.50 0.50 0.50	U U U
87-61-61,2,3-Trichlorobenzene	0.50	_

EPA SAMPLE NO.

TW263

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

GC Column: DB-624

CAS NO.

Matrix: (soil/water) WATER

Lab Sample ID: E0476-43

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4572

Level: (low/med)

LOW

Date Received: 04/07/98

Date Analyzed: 04/11/98

% Moisture: not dec.

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50	U
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
75-34-3	1,1-Dichloroethane	0.94	
	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	
	1,2-Dichloroethane	0.50	
	Bromochloromethane	0.50	
	Chloroform	0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	1.8	
	1,1-Dichloropropene	0.50	
	Trichloroethene	0.51	١٠
	1,2-Dichloropropane	0.50	TT
71-43-2		0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
	trans-1,3-Dichloropropene	0.50	
	1,1,2-Trichloroethane	0.50	•
	Tetrachloroethene	1.2	ı
		0.50	
	1,3-Dichloropropane	0.50	l .
	Dibromochloromethane	0.50	
	1,2-Dibromoethane	_ 1	4
TO8-AO-\	Chlorobenzene	0.50	U

EPA SAMPLE NO.

TW263

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-43

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4572

Level: (low/med)

) LOW

. .

% Moisture: not dec.

Date Received: 04/07/98

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Coil Aliens Walnus

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

630-20-6	1,1,1,2-Tetrachloroethane	0.50 ປັ
	Ethylbenzene	0.50 U
136777-61-2-	m,p-Xylene	0.50 U
95-47-6	o-Xylene	0.50 U
100-42-5		0.50 U
	Bromoform	0.50 U
98-82-8	Isopropylbenzene	0.50 U
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U
108-86-1	Bromobenzene	0.50 U
96-18-4	1,2,3-Trichloropropane	0.50 U
103-65-1	n-Propylbenzene	0.50 U
95-49-8	2-Chlorotoluene	0.50 U
108-67-8	1,3,5-Trimethylbenzene	0.50 U
106-43-4	4-Chlorotoluene	0.50 U
98-06-6	tert-Butylbenzene	0.50 U
95-63-6	1,2,4-Trimethylbenzene	០.50 ប
135-98-8	sec-Butylbenzene	0.50 U
541-73-1	1,3-Dichlorobenzene	0.50 บ
99-87-6	4-Isopropyltoluene	0.50 บ
106-46-7	1,4-Dichlorobenzene	0.50 U
	n-Butylbenzene	0.50 U
95-50-1	1,2-Dichlorobenzene	0.50 U
96-12-8	1,2-Dibromo-3-chloropropane	0.50 X K
120-82-1	1,2,4-Trichlorobenzene	0.50 ປີ '`
87-68-3	Hexachlorobutadiene	0.50 U
91-20-3	Naphthalene	0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.50 U

336

EPA SAMPLE NO.

TW264

Lab Name: MITKEM CORP.

Contract:

SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-44

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4594

Level: (low/med) LOW

Lab Code: MITKEM Case No.:

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

Q

CAD NO.		(ug/II OI	ug/10g/	00/1	V
75-71-8	Dichlorodifluoro	methane		0.50	II
	Chloromethane			0.50	
	Vinyl Chloride			0.50	
74-83-9	Bromomethane			0.50	
	Chloroethane			0.50	
	Trichlorofluorom	ethane		0.50	
	1,1-Dichloroethe			0.50	
	Methylene Chlori			1.6	
	trans-1,2-Dichlo		—	0.50	TT
	Methyl tert-buty		—	0.50	
	1,1-Dichloroetha		—	0.60	
	cis-1,2-Dichloro		— <u> </u>	0.50	Ū
	2,2-Dichloroprop			0.50	
107-06-2	1,2-Dichloroetha	ne		0.50	
	Bromochlorometha			0.50	
	Chloroform			0.50	
	Carbon Tetrachlo	ride	_	0.50	
	1,1,1-Trichloroe			1.1	J
563-58-6	1,1-Dichloroprop	ene		0.50	U
79-01-6	Trichloroethene	-		0.50	U .
	1,2-Dichloroprop	ane		0.50	ן די
71-43-2	Benzene			0.50	U
	Dibromomethane			0.50	U
75-27-4	Bromodichloromet	hane		0.50	U
10061-01-5	cis-1,3-Dichloro	propene		0.50	U.
108-88-3	Toluene			0.50	U
10061-02-6	trans-1,3-Dichlo	ropropene		0.50	U
79-00-5	1,1,2-Trichloroe	thane		0.50	U
127-18-4	Tetrachloroethen	e		0.56	l
142-28-9	1,3-Dichloroprop	ane		0.50	Ū
124-48-1	Dibromochloromet	hane		0.50	U
106-93-4	1,2-Dibromoethan	e		0.50	U
	Chlorobenzene			0.50	U
·	······································			•	

FORM I VOA

EPA SAMPLE NO.

TW264

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-44

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4594

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/12/98

GC Column: DB-624

ID: 0.25 (mm)

COMPOUND

Dilution Factor: 1.0

Soil Extract Volume: (uL)

CAS NO.

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	U
100-41-4Ethylbenzene	0.50	U
136777-61-2m,p-Xylene	0.50	U
95-47-6o-Xylene	0.50	U
100-42-5Styrene	0.50	U
75-25-2Bromoform	0.50	ש
98-82-8Isopropylbenzene	0.50	ַ
79-34-51,1,2,2-Tetrachloroethane	0.50	υ
108-86-1Bromobenzene	0.50	U
96-18-41,2,3-Trichloropropane	0.50	U
103-65-1n-Propylbenzene	0.50	U
95-49-82-Chlorotoluene	0.50	Ū
108-67-81,3,5-Trimethylbenzene	0.50	U
106-43-44-Chlorotoluene	0.50	U
98-06-6tert-Butylbenzene	0.50	U
95-63-61,2,4-Trimethylbenzene	0.50	U
135-98-8sec-Butylbenzene	0.50	U
541-73-11,3-Dichlorobenzene	0.50	U
99-87-64-Isopropyltoluene	0.50	U
106-46-71,4-Dichlorobenzene	0.50	U
104-51-8n-Butylbenzene	0.50	U
95-50-11,2-Dichlorobenzene	0.50	U ~
96-12-81,2-Dibromo-3-chloropropane	0.50	UN
120-82-11,2,4-Trichlorobenzene	0.50	U
87-68-3Hexachlorobutadiene	0.50	ט
91-20-3Naphthalene	0.50	U
87-61-61,2,3-Trichlorobenzene	0.50	U

EPA SAMPLE NO.

TW265

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-45

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4574

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/L

Q

75-71-8Dichlorodifluoromethane	0.50	U
74-87-3Chloromethane	0.50	U
75-01-4Vinyl Chloride	0.50	U
74-83-9Bromomethane	0.50	U
75-00-3Chloroethane	0.50	U
75-69-4Trichlorofluoromethane	0.50	U
75-35-41,1-Dichloroethene	0.50	U
75-09-2Methylene Chloride	0.50	U
156-60-5trans-1,2-Dichloroethene	0.50	U
1634-04-4Methyl tert-butyl ether	0.50	U
75-34-31,1-Dichloroethane	0.50	U
156-59-2cis-1,2-Dichloroethene	0.50	U
590-20-72,2-Dichloropropane	0.50	U
107-06-21,2-Dichloroethane	0.50	U
74-97-5Bromochloromethane	0.50	U
67-66-3Chloroform	0.50	Ū
56-23-5Carbon Tetrachloride	0.50	U _
71-55-61,1,1-Trichloroethane	0.84	J
563-58-61,1-Dichloropropene	0.50	Ū
79-01-6Trichloroethene	0.50	Ū
78-87-51,2-Dichloropropane	0.50	U
71-43-2Benzene	0.50	U
74-95-3Dibromomethane	0.50	U
75-27-4Bromodichloromethane	0.50	
10061-01-5cis-1,3-Dichloropropene	0.50	
108-88-3Toluene	0.50	
10061-02-6trans-1,3-Dichloropropene	0.50	
79-00-51,1,2-Trichloroethane	0.50	
127-18-4Tetrachloroethene	0.50	U
142-28-91,3-Dichloropropane	0.50	
124-48-1Dibromochloromethane	0.50	
106-93-41,2-Dibromoethane	0.50	
108-90-7Chlorobenzene	0.50	
Too you, control contr	0.50	
		·——

EPA SAMPLE NO.

TW265

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-45

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4574

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

630-20-61,1,1,2-Tetrachloroethane	0.50	U
100-41-4Ethylbenzene	0.50	U
136777-61-2m,p-Xylene	0.50	Ū
95-47-6o-Xylene	0.50	_
100-42-5Styrene	0.50	-
75-25-2Bromoform	0.50	
98-82-8Isopropylbenzene	0.50	
79-34-51,1,2,2-Tetrachloroethane	0.50	_
108-86-1Bromobenzene	0.50	
96-18-41,2,3-Trichloropropane	0.50	
103-65-1n-Propylbenzene	0.50	
95-49-82-Chlorotoluene	0.50	-
108-67-81,3,5-Trimethylbenzene	0.50	_
106-43-44-Chlorotoluene	0.50	
98-06-6tert-Butylbenzene	0.50	
95-63-61,2,4-Trimethylbenzene	0.50	-
135-98-8sec-Butylbenzene	0.50	
		_
541-73-11,3-Dichlorobenzene	0.50	
99-87-64-Isopropyltoluene	0.50	_
106-46-71,4-Dichlorobenzene	0.50	_
104-51-8n-Butylbenzene	0.50	-
95-50-11,2-Dichlorobenzene	0.50	
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	-
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	U

1A VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW266

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-46

Sample wt/vol: 25.00 (g/mL) ML

LOW

Lab File ID: V2B4575

Level: (low/med) % Moisture: not dec. Date Received: 04/07/98 Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

CAD NO.	COM COND	(ug/II OI	ug/ng/	00/1	Q
75-71-8	Dichlorodifluoro	methane		0.50	IT
	Chloromethane			0.50	
	Vinyl Chloride		—- <u> </u>	0.50	
74-83-9	Bromomethane			0.50	
	Chloroethane			0.50	
75-69-4	Trichlorofluorom	ethane		0.50	
	1,1-Dichloroethe			1.0	
	Methylene Chlori			0.50	Ū
	trans-1,2-Dichlo		<u> </u>	0.50	
1634-04-4	Methyl tert-buty	l ether -		0.50	
75-34-3	1,1-Dichloroetha	ine		2.3	
156-59-2	cis-1,2-Dichloro	ethene		0.50	Ū
	2,2-Dichloroprop			0.50	ı
107-06-2	1,2-Dichloroetha	ine		0.50	U
74-97-5	Bromochlorometha	ne		0.50	U
67-66-3				0.50	ט
56-23-5	Carbon Tetrachlo	ride		0.50	U 🦼 🗆
	1,1,1-Trichloroe			4.0	ا ا
	1,1-Dichloroprop	ene		0.50	
	Trichloroethene_			1.5	
78-87-5	1,2-Dichloroprop	ane		0.50	
71-43-2				0.50	U
	Dibromomethane			0.50	U
	Bromodichloromet			0.50	
	cis-1,3-Dichloro	propene		0.50	
108-88-3				0.50	
	trans-1,3-Dichlo			0.50	
	1,1,2-Trichloroe			0.50	
	Tetrachloroether			0.50	
142-28-9	1,3-Dichloroprop	ane		0.50	1
	Dibromochloromet			0.50	
	1,2-Dibromoethan	ie		0.50	
108-90-7	Chlorobenzene			0.50	ן ט

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW266

Lab Name: MITKEM CORP.

Contract:

Case No.: SAS No.: SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-46

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID: V2B4575

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

			Ī
630-20-6	1,1,1,2-Tetrachloroethane	0.50	U
100-41-4	Ethylbenzene	0.50	
136777-61-2		0.50	_
95-47-6		0.50	
100-42-5		0.50	_
75-25-2		0.50	
98-82-8	Isopropylbenzene	0.50	Ū
79-34-5	1,1,2,2-Tetrachloroethane	0.50	_
108-86-1	Bromobenzene	0.50	t e
	1,2,3-Trichloropropane	0.50	Ū
103-65-1	n-Propylbenzene	0.50	Ū
	2-Chlorotoluene	0.50	Ū
108-67-8	1,3,5-Trimethylbenzene	0.50	
106-43-4	4-Chlorotoluene	0.50	Ū
98-06-6	tert-Butylbenzene	0.50	Ū
95-63-6	1,2,4-Trimethylbenzene	0.50	Ū
135-98-8	sec-Butylbenzene	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	Ū
99-87-6	4-Isopropyltoluene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
	n-Butylbenzene	0.50	ט
95-50-1	1,2-Dichlorobenzene	0.50	Uη
96-12-8	1,2-Dibromo-3-chloropropane	0.50	TEN K
120-82-1	1,2,4-Trichlorobenzene	0.50	
87-68-3	Hexachlorobutadiene	0.50	U
91-20-3	Naphthalene	0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-47

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4576

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

75-71-8	Dichlorodifluoromethane	0.50	TT
	Chloromethane	0.50	
	Vinyl Chloride	0.50	
	Bromomethane	0.50	
	Chloroethane	0.50	
	Trichlorofluoromethane	0.50	
	1,1-Dichloroethene	0.50	
	Methylene Chloride	0.50	
	trans-1,2-Dichloroethene	0.50	
	Methyl tert-butyl ether	0.50	
	1,1-Dichloroethane	0.50	
	cis-1,2-Dichloroethene	0.50	
	2,2-Dichloropropane	0.50	1
107-06-2	1,2-Dichloroethane	0.50	
	Bromochloromethane	0.50	i
67-66-3		0.50	
	Carbon Tetrachloride	0.50	
	1,1,1-Trichloroethane	0.50	
563-58-6	1,1-Dichloropropene	0.50	
79-01-6	Trichloroethene	0.50	
	1,2-Dichloropropane	0.50	
71-43-2		0.50	
	Dibromomethane	0.50	
	Bromodichloromethane	0.50	
	cis-1,3-Dichloropropene	0.50	
108-88-3		0.50	
	trans-1,3-Dichloropropene	0.50	
79-00-5	1,1,2-Trichloroethane	0.50	
	Tetrachloroethene	0.50	
	1,3-Dichloropropane	0.50	
	Dibromochloromethane	0.50	1
	1,2-Dibromoethane	0.50	4
	Chlorobenzene	0.50	
IOO-30-7			ا ّ
		1	l

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VOLATILE ORGANICS ANALYSIS DATA SHEET

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EPA SAMPLE NO.

TW37

Lab Name: MITKEM CORP.

Contract:

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-47

Lab Code: MITKEM

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4576

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

CAS NO.

COMPOUND

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Q

630-20-61,1,1,2-Tetrachloroethane	0.50	-
100-41-4Ethylbenzene 136777-61-2m,p-Xylene	0.50	I -
95-47-6	0.50	, -
100-42-5Styrene	0.50	j
75-25-2Bromoform	0.50	1 -
98-82-8Isopropylbenzene	0.50	-
79-34-51,1,2,2-Tetrachloroethane	0.50	
108-86-1Bromobenzene	0.50	_
96-18-41,2,3-Trichloropropane	0.50	-
103-65-1n-Propylbenzene	0.50	-
95-49-82-Chlorotoluene	0.50	-
	0.50	_
108-67-81,3,5-Trimethylbenzene	0.50	_
100-43-44-Chiorocoluene	0.50	
98-06-6tert-Butylbenzene	0.50	-
95-63-61,2,4-Trimethylbenzene	0.50	
135-98-8sec-Butylbenzene	0.50	
541-73-11,3-Dichlorobenzene	0.50	_
99-87-64-Isopropyltoluene	0.50	_
106-46-71,4-Dichlorobenzene	0.50	
104-51-8n-Butylbenzene	0.50	
95-50-11,2-Dichlorobenzene	0.50	U V
96-12-81,2-Dibromo-3-chloropropane	0.50	
120-82-11,2,4-Trichlorobenzene	0.50	
87-68-3Hexachlorobutadiene	0.50	
91-20-3Naphthalene	0.50	
87-61-61,2,3-Trichlorobenzene	0.50	U

FORM I VOA

Case No.:

25.00 (g/mL) ML

Lab Code: MITKEM

Sample wt/vol:

EPA SAMPLE NO.

SDG No.: E0476

V2B4418

TENTATIVELY	/ IDENTIFIED COMPOUNDS	
Lab Name: MITKEM CORP.	Contract:	TB03
	. Concrace.	

SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: E0476-01

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. Date Analyzed: 04/07/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Lab File ID:

Number TICs found: 2 (ug/L or ug/Kg)

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
	UNKNOWN UNKNOWN	4.89 15.05		J J
4.				
5. 6.				
8.				
9				
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J.				
5.				
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6.				
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9				

-051

FORM I VOA-TIC

EPA SAMPLE NO.

TW172

Lab	Name:	MITKEM	CORP.

Contract:

SAS No.:

LOW

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-16

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4433

Level: (low/med)

Lab Code: MITKEM Case No.:

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

1		or ug/11g/	-3/ -	
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	=======================================	=======	========	=====
1				
2. 3.				
1 +• 1				
J				
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10.		<u> </u>		
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1 44.				· .
18.				
19.				
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22				
23. I				
24.	· · · · · · · · · · · · · · · · · · ·			
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FORM I VOA-TIC

EPA SAMPLE NO.

TW173	

Tah	ATama.	AAT TITZTINA	CODD
Lati	name:	MITKEM	CORP.

Contract:

Matrix: (soil/water) WATER

SAS No.:

SDG No.: E0476

Lab Code: MITKEM

Lab File ID:

Lab Sample ID: E0476-17

Sample wt/vol:

25.00 (g/mL) ML

Case No.:

V2B4434

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1		======	=========	=====
2.				
J.				
			.	
5				
/ •				
J.				
10.				
14.				
13.				
T.T. I				
1 ·				
17.				
10.				
13.				
20				
22.				
23.				
2 + •				ļ ———
ZD.				
26. 27.				
40.				
29.				
30.		l		

EPA SAMPLE NO.

_			
Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-18

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4444

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

ID: 0.25 (mm)

Date Analyzed: 04/08/98

GC Column: DB-624

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 2.	UNKNOWN	15.04	1.5	J =====	R
2. 3. 4.					
5. 6. 7.					
9.					
11.					
13. 14. 15.					
16. 17.					
18. 19. 20.					
21. 22.					
23. 24. 25.					
26. 27.					
28. 29. 30.					

FORM I VOA-TIC

EPA SAMPLE NO.

TW175

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab File ID:

V2B4445

Sample wt/vol:

25.00 (g/mL) ML

Level:

(low/med)

LOW

Date Received: 04/07/98

Lab Sample ID: E0476-19

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____ (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. U	HENOWN	15.04	3.2	===== 2
2.				
J				
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9.				
10.				
11.				
14.				
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16. 17.				
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22.				<u></u>
23			•	
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26.				
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30.				

FORM I VOA-TIC

EPA SAMPLE NO.

TW176	
111170	

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-20

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4446

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
 1.	UNKNOWN	15.04	3.9	8
2	<u> </u>			
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<i>/</i> •				
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LZ.				
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L4.				
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L9.				
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27.				
48.				
29				
30				
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FORM I VOA-TIC

EPA SAMPLE NO.

TW177

Tah	Mama	MITKEM	COPD
Lab	name:	IAIT T V CTIAI	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab File ID:

Sample wt/vol:

25.00 (g/mL) ML

V2B4447

Level: (low/med) LOW

Date Received: 04/07/98

Lab Sample ID: E0476-21

% Moisture: not dec. _____

Number TICs found: 1

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST.	CONC.	Q
	COMPOUND NAME UNKNOWN	15.04	======	1.8	
2					1
3				·	-
4.					
5.					
6.					
7					
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9.					
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	TW178	

EPA SAMPLE NO.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-22

Sample wt/vol: 25.00 (q/mL) ML

Lab File ID:

V2B4448

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER COMPOUND NAME RTEST. CONC. ======= UNKNOWN 3.1 J 15.04 2. 3. 9. 10. 11. 12. 13. 14. 15._ 16.___ 17. 19. 20. 21. 22. 23.__ 24._ 25._ 26._ 27._ 28._ 29. 30.

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FORM I VOA-TIC

EPA SAMPLE NO.

TW179

Lab	Name:	MITKEM	CORP.
_~~	TIVILLO .		

Contract:

Lab Code: MITKEM

EM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-23

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4449

Level: (low/med)

/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

Number TICs found: 1

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Į.
	======================================	15.04	1.9	J
2.				
3				
4		-		
5				·
6.				
7.				
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9				
10.				
LL. I				
12.				
13.				
14.				
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ZI.				
22.		.		
23.				
24.				
25.				
26.		.		
4/.				
28.				
29.				
30				1

-114

FORM I VOA-TIC

EPA SAMPLE NO.

TW 180	

_			
Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-24

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4450

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. ___

Date Analyzed: 04/08/98

GC Column: DB-624

Number TICs found: 1

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST.	CONC.	Q
======================================	NKNOWN	15.04	=====	1.5	J
2					
·		.	***		
T •		-			l
J		.			
6		— -			
7					
9:		— -			
ō		-			
1		-		·	
2		-			
3		-			
4.		-			
J •		_ -			l
0.		— -			
7.					
8.					ļ
9.					
0					
1					
2					
3		_			
4					
5		_			
6		-		 	
7		-	•		
8		— ———			
9		_			
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FORM I VOA-TIC

EPA SAMPLE NO.

TW181	

Lab Name: N	MITKEM (CORP.
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Lab Code: MITKEM

Contract:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-25

Sample wt/vol:

25.00 (g/mL) ML

Case No.:

Lab File ID: V2

V2B4451

Level: (low/med)

d) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT		CONC.		
1.	UNKNOWN	15.04	======	2.7	===== 8	K
2.						-
] 3.						-
4. 5.						
0.						-
7						
9						
10.						-
1 14.						_
1 13.					l	-
14. 15.						
16.		 				-
18.						-[
<u>1</u> 9.						-
1 20.						-
21.]
1 23.						-
24. 25.						1
1 26.						-
1 41.						-
28						-
30						-
l		l	l		1	_

132

FORM I VOA-TIC

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EPA SAMPLE NO.

Lab Name: MITKEM COF	Lab	Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-26

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4452

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 1

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME		EST. CONC.		
1.	UNKNOWN	15.05	4.8		}
2	-				•
J					
4					
5.					
7					
8.					
9.					
10.					
11.					
12.					
14.					
15.					
16.					
17					
18		·			
19					
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22.					
23.					
24.					
25. 26.					
27					
28.					
29.					
30.					

FORM I VOA-TIC

EPA SAMPLE NO.

TW183

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4453

Level: (low/med)

LOW

Date Received: 04/07/98

Lab Sample ID: E0476-27

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	15.05	3.0	J. J.
2.	-			
4. 5.				
6. 7.				
8.				
10.	4444			
11.		-		
13.				
15. 16.				
17				
19.	<u> </u>			
21.				
23.				
25.				
26. 27.				
29.			·	
30.				

FORM I VOA-TIC

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML Lab File ID:

V2B4454

Level:

(low/med) LOW

Date Received: 04/07/98

Lab Sample ID: E0476-28

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Number TICs found: 1

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	15.04	1.00	
2	-			
3				
4.		_ _		
5		_ .		
6				
7		_ .		
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3		- -		İ
5		-	····	
6.		_ -		
7.	,	- -	· · · · · · · · · · · · · · · · · · ·	
8.		_	· · · · · · · · · · · · · · · · · · ·	
9:		- -		
0.				
1.				
2. 1				
3. 1				
4.				
J				
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FORM I VOA-TIC

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	TW22)

EPA SAMPLE NO.

Lab N	ame:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-02

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4419

Level: (low/med) LOW

% Moisture: not dec.

Date Received: 04/07/98

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1.	UNKNOWN	15.05	2.1	JB
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3.				
4.				
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6.		-		
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8		-		
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30.		-		

FORM I VOA-TIC

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TW23	

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.

Contract:

TW23	
	- 1

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-03

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4420

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/07/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.		
1.	UNKNOWN	15.04	3.9	JB K	१
2. 3. 4.	-				
5.					
6. 7. 8.			****		
9					
11.					
13					
15. 16.					
18.					
19.					
21.					
23. 24. 25.			Manage Control of the		
26. 27.					
28.					
30					

FORM I VOA-TIC

EPA SAMPLE NO.

TW24	

Lah	Name ·	MITKEM	CORP
பவ	manie:	LIT TIVELI	CORE.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4421

Level:

(low/med)

LOW

Date Received: 04/07/98

Lab Sample ID: E0476-04

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	15.04	5.4	JB
3. 4.				
5. 6. 7.				
9.				
10.				
14.				
15. 16. 17.				
18. 19. 20.				
21. 22.				
24.		_		
25. 26. 27.				
28. 29.		_		
30.				

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FORM I VOA-TIC

TW25	
11125	

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-05

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4422

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Dilution Factor: 1.0

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Number TICs found: 1

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME		EST. C		
======================================	NKNOWN	15.04	======	3.2	
2.		-5:52		3.2	92
3		····			
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5.			·- ·-		
6.					
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4.	·····	_ -			
J.		_ -			
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6	The state of the s	_ -			
7					
8		_			
9		— ———— -		·	
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Z. I		_ -			
J.				-	
4.					
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9.		_			
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FORM I VOA-TIC

EPA SAMPLE NO.

Lab Name: MITKEM COR

Contract:

SAS No.:

Lab Code: MITKEM

Case No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-05DL

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4442

Level: (low/med)

LOW

Soil Extract Volume: (uL)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 5.0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2.	UNKNOWN	15.04	4.7	
4.				
5. 6. 7.				
9.				
10. 11. 12.				
14.				
16. 17.				
18. 19. 20.		·		
21 22.				
23 24.				
25. 26. 27.				
28 29.				
30				

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FORM I VOA-TIC

TW250	
	i

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.
	INCHILL .	1.17 1.1777.1	COLU.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-30

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4456

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume:____(uL)

Number TICs found: 0

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	EST. CONC.	
1.			=====
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3.4.		 	
5.		 	
0.			
/·			
8		 	
10.		 	
11.	,		
1∠.		 	
13		 	
1J.			
TO.			
17.			
19.	7.11	 	
20.		 	
21. I			
44.		 	
23.		 	
49.			
20.			
21.			
28. 29.		 *	
30.		 	

FORM I VOA-TIC

EPA SAMPLE NO.

Lab Name: MITKEN	A CURD

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4457

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Lab Sample ID: E0476-31

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
		= ======	=========	====
1			ļ	ļ
2				l
J.		- 		l
4. 5.				·
ĕ.—— -		_		
6				l
7.		-		l
8				l
9		-		
0		_		
1				l
4.				l
J. [
T. 1				
J. 1		_		
V. I				
/·		_		ļ
0.		_		
9.		_		
0	1.00	_		
1		_		
∠.		_		
J.		_		
4. i		_		
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FORM I VOA-TIC

EPA SAMPLE NO.

TW252	
111252	

Lab Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-32

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4561

Level:

(low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1. 2	UNKNOWN	15.04	1.6	JB =====
3. 4.				
5.				
8.				
9. 10.				
11. 12.				
14.				
15. 16. 17.				
18. 19.				
21.				
22.				
24				
26. 27.				
28. 29. 30.				
30				

FORM I VOA-TIC

EPA SAMPLE NO.

TW253	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML Lab File ID: V2B4562

Level: (low/med) LOW

16.__

Date Received: 04/07/98

Lab Sample ID: E0476-33

% Moisture: not dec. _____

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Number TICs found: 1

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

COMPOUND NAME RTEST. CONC. CAS NUMBER _____ 15.04 0.57 UNKNOWN

11. 12. 13. 14.___ 15.

17._ 18._ 19. 20. 21._ 22.

23._ 24. 25._ 26._ 27. 28.

29. 30.

TW254	

EPA SAMPLE NO.

Lab Name: 1	MITKEM (CORP.
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Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-34

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4563

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec. _____

LOW

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 1

Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.		_
1.	UNKNOWN	15.04	1.5	==== JB/	R
2					
3.					
5				ļ	
6.					
7.					
8.					
10.	·				
11.				l	
12.					
13.					
14.				l	
16.					
17.			-		
18.					
19.					
21.					
22.					
23.					
24. 25.					
26.					
27.	-	· ·			
28.					
29. 30.				<u> </u>	
J					

FORM I VOA-TIC

EPA SAMPLE NO.

TW255

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4564

Level: (low/med)

Date Received: 04/07/98

LOW

Date Analyzed: 04/11/98

Lab Sample ID: E0476-35

% Moisture: not dec. ____

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume:____(uL)

GC Column: DB-624

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.		
 1.	UNKNOWN	15.04	1.4	JB/	R
2.					Ű,
J					
4.		_			
5		_			
1 6.	_	_			
7.			4		4
9.					1
10.		-			
11.					
12.					
LJ.		_			
14 .		_			
1 13.		_			
16. 17.		-			
18.	-	-			
19.		-			
20.					
1 21.					
		_			
23.		_	·	·	
24.		_[
25.	_	_			
26.		-			
27. 28.		-			
29		-			
30.		-			

FORM I VOA-TIC

Sample wt/vol: 25.00 (g/mL) ML

VOLATILE ORGANICS ANALYSIS DATA SHEET

SDG No.: E0476

V2B4565

Lab	Name:	MITKEM		Contract:	TW256
Lab	Code:	MITKEM	Case No.	: SAS No.: SDG	No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-36

Level: (low/med) LOW Date Received: 04/07/98

% Moisture: not dec. Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL) Soil Extract Volume: (uL)

CONCENTRATION UNITS:

Lab File ID:

(ug/L or ug/Kg) ug/L Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1.	UNKNOWN	15.04	1.7	
2	-			
	-			
± • 1				
5.				
/ •				
0.			-	
9.				
±0.				
11.				
12.				
14.				
15. I				
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18. 19.				<u></u>
20.				
44.				
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<i>4</i> 3.				
44.				
25. 26.				
27. I				
20.				
29.				
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FORM I VOA-TIC

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.

Lab Code: MITKEM

Contract:

SAS No.:	SDG No.:	E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-37

Sample wt/vol:

25.00 (g/mL) ML

Case No.:

Lab File ID: V2B4566

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	1
1. UI	NKNOWN	15.04	1.5	JB
2. 3. 4.			_,,	
3				
		_		
5.		-		ļ
b.		_		
7		-		
8.		-		ļ
9		-		
11	The second secon	-		
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14. I				
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		_		
		-		·
10.				
1.J.		-		
20	4.	-		
22				
22.		-1		
Z 4.				
25. I				
20.				
27.				
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FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW258

Lab Name:	MITKEM	CORP.
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Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-38

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4567

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.74	0.89	
2	-			
4		-		
5	_	·		
7.		· 		
8.		·		
9.				
10.				
111.				
1 12.		·		
13. 14.		.		
15				
16. 17.				i
17.				
1 19.				
20.				
21.				
23.		·		<u> </u>
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25.				
26.				<u> </u>
27.				
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FORM I VOA-TIC

EPA SAMPLE NO.

TW259	

Lab	Name ·	MTTKEM	CORP

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-39

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4568

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. ____

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT		CONC.	
1. UN	KNOWN	15.04		1.1	
2					ا ا
3					
1 •					
5	·	_			
0.					
7.				 	
8.		-		 	l
9.		-			.——
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.5.		-			
4.					
.5.					
J					
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8.		-			
9.		- 			-
1.		-			
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6.		_			
7.					
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FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW26	
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Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-06

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4423

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Number TICs found: 1

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	15.04	5.2	JB 0
2. 3. 4.	-	-		
3		-		
4.				
, 0.				
1 7.				
8.		-		
10.				
1 11.				
1 14.				
1 13.		-		
14				
16.				
1 1/.			-	
18.		-		
19. 20.		-		
41.				
44.				
23.				
24.		-		
26.		-		<u> </u>
27.				
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29.		-		
30	-	-		

FORM I VOA-TIC

EPA SAMPLE NO.

TW260	

Lab	Name:	MITKEM	CORP.

Contract:

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-40

Sample wt/vol:

Lab Code: MITKEM

25.00 (g/mL) ML

Lab File ID:

V2B4569

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: ____(uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT		CONC.	
1.	UNKNOWN	15.03		1.2	
2	·	13.03		1.2	165
3					
3	***************************************				l ———
4					
6.					
6					·
7					
9					l
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2.					i
3					
4			. 		
5.			-		l
6.					
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8				·	
9					
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3.					l
4					
4.			***************************************		l
6					
7					
7					
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29					
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FORM I VOA-TIC

EPA SAMPLE NO.

TW261

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

V2B4570

Matrix: (soil/water) WATER

(low/med)

Lab Sample ID: E0476-41

Lab File ID:

Sample wt/vol: 25.00 (g/mL) ML

Level:

LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1. U	INKNOWN	15.04	0.96	
2				
4.				
3				
6. 7.				
0.				
J. 1				
11.				
14.				
13.				
15.				
17. 18.	· · · · · · · · · · · · · · · · · · ·			
19.				
20				
22.				
23.				
43.				
∠o. I				
27.	· · · · · · · · · · · · · · · · · · ·			
29.				
30				

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FORM I VOA-TIC

1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW262	
	l

T.ah	Name ·	MITKEM	CORP

Contract:

Lab	Code:	MITKEM	Case	No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-42

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4571

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	15.03	1.2	JB .
2. 3.				
4. 5.				
6.				
7. 8.				
9. 10.				
l 11.				
12.				
15.				
16				
1 10.				
20.				
22.				
23. 24.				
25.				\ <u></u>
26. 27.				
28				
30				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

T _ l_	NT	A CONTENA	CODD
Lab	Name:	MITKEM	CORP.

Contract:

Lab	Code:	MITKEM	(

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

25.00 (g/mL) ML

Lab File ID:

Sample wt/vol:

Level:

(low/med) LOW

V2B4572

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

Lab Sample ID: E0476-43

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
	UNKNOWN	15.03	1.9	JB/
2				
-3				<u> </u>
4.			·	
5				İ
6				
7.				<u> </u>
9.				
10				
11.				
12.				
13.				l
14.				
15.				
17				
16. 17. 18.				ļ——
19.			•	
20.			· · · · · · · · · · · · · · · · · · ·	
21.				
22.				
23.				
24.				
25.				
26.			·····	
27. 28.				
29.				
30				
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FORM I VOA-TIC

1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW264	

Lab Name: 1	MITKEM ·	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab File ID:

V2B4594

Sample wt/vol: 25.00 (g/mL) ML

Level: (low/med)

% Moisture: not dec. _____

LOW

Date Received: 04/07/98

Lab Sample ID: E0476-44

Date Analyzed: 04/12/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
 1.	UNKNOWN	15.03	1.2	
2	ONGIOWIN	15.03	1.2	س ا
2				
3. <u> </u>		- j 		
		-1		
5. 6.		-		
7		-		
8.		-		
9.		_		<u> </u>
10				
11.				
12.				
13.				
14.				
16.				
1 .				
18.				
19.				
20.				
21.		_		
22.				
<i>.</i>				
24.		_		ļ
43.		_		
20.		_		
21.		_		
20.		_		
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VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW265	

Lab Name: MITKEM COR	
Lao Name: Milkew Ok	ν.

Contract:

T 447	03	

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-45

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4574

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 1

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
2.	UNKNOWN	15.03	EST. CONC.	#8
3. 4. 5. 6.				
7. 8. 9.				
10				
14 15 16.				
18 19				
21.				
24				
27. 28. 29.				

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW266	
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Tab.	Name ·	MITKEM	CORP

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-46

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4575

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/11/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	15.03	0.97	JB
2.		13.03	0.57	
2. 3.				
4			-	
5				
υ.				
7.		i		
0.				
9				
10.				
				
12.				
13.				
14.				
15				
16.				
1/.				<u> </u>
18.				
19.		ļ.——		
20.				
21.				
22.				l
23.				
24				
25.				
26.				
27. 28.				
29.		l		
30				<u> </u>

FORM I VOA-TIC

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

	_
TW27	

Lab Name: MITKEM CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-07

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4441

Level: (low/med)

LOW

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

FORM I VOA-TIC

1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TW28

EPA SAMPLE NO.

Lab Name: MITKEM CORF	•

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-08

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4425

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	1 1	
 1.	UNKNOWN	15.05	1.6	JB	1
2. 3.					
3	-				
4. 5.	•		-		
ь.					
/ .					
8. 9.		-			
IU.					
<u></u>	-				
12.					
1.0.					
17.					
10	-			<u> </u>	
21.					
22.					
4.3.	-				
24.	-				
∠७.					
27.	-				
28. 29.					
30.					

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FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA	SAMPLE	NO.
,		

Lab	Name:	MITKEM	CORP.

Contract:

TW	29	

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-09

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4426

Level:

(low/med)

LOW

% Moisture: not dec. ___

Date Received: 04/07/98 Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	
1.	UNKNOWN	15.04	3.4	JB
2	•			
3				.
5				
6.			· · · · <u>·</u>	·
7.				
0.				
9				
10	- M			·
12. I				
13.				
				
15.				
16				.
18.				
19				·
20.				
21.				
44.				
23.		[.
25			, , , , , , , , , , , , , , , , , , ,	
26.				
41.				
28.				
۵).				.
30.				

FORM I VOA-TIC

1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW30	

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-10

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4443

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec. __

LOW

Date Analyzed: 04/08/98

GC Column: DB-624

Number TICs found: 1

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

4. 5. 6. 7. 8. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9.	CAS NUMBER	COMPOUND NAME			CONC.	
2. 3. 4. 5. 6. 7. 8. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9.	i i			=====		
4. 5. 6. 7. 8. 9. 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 0. 1. 2. 3. 4. 5. 6. 7. 8. 9.						
5. — 6. — 7. — 8. — 9. — 3. — 4. — 5. — 6. — 7. — 8. — 9. — 1. — 2. — 3. — 4. — 5. — 6. — 7. — 8. — 9. —	3,					· · · · · · · · · · · · · · · · · · ·
5. — 6. — 7. — 8. — 9. — 4. — 5. — 6. — 7. — 8. — 9. — 1. — 2. — 3. — 4. — 5. — 6. — 7. — 8. — 9. —	≖•					
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8.	6					
8.	7	the second secon	<u></u> -			
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1.	9		-			l
3 .	· ·]			
3. 4. 5. — 6. — 7. — 8. — 9. — 1. — 2. — 3. — 4. — 5. — 6. — 7. — 8. — 9. —	2]			
4. 5. 6. 7. 8. 9. 0. 1. 2. 3. 4. 5. 6. 7. 8. 9.	~ ·		} -			İ
5. — 6. — 7. — 8. — 9. — 1. — 2. — 3. — 4. — 5. — 6. — 7. — 8. — 9. —	4					
6.	5.				· · · · · · · · · · · · · · · · · · ·	
7. 8. 9. 0.	6.					
8	7.					
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2. 3. 4. 5. 6. 7. 8. 9.	0.					
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4. 5. 6. 7. 8. 9.	2		-			
6. 7. 8. 9.	3			···		l
6. 7. 8. 9.	5.		-			
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8	7.					
9	8.					
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402

FORM I VOA-TIC

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab Name: M.	ITKEM	CORP.
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Contract:

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-11

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID:

V2B4428

Level:

(low/med) LOW

% Moisture: not dec.

Date Received: 04/07/98 Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT		CONC.		
1.	UNKNOWN	15.05		5 0	JB	8
2		13.03		3.0		"
3						1
1						1
5.			-			1
0.						1
/ •						
8.						.
1 9.	·					1
10.					l	.
1 11.	71111				 	
1 14.			-		l	}
1 13.					 	1
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15		·			ļ	
16.				 	ļ 	
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18						ł
19.						1
21.						1
22.					<u> </u>	
1 23.					 	1
24.		l				
1 43.						
26.						
1 41.						
28.						
29.						
30.						
		l			l	

FORM I VOA-TIC

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-12

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID: V2B4429

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.		0
1.	UNKNOWN	15.04			R
2.		_			
4.					
5.					
8.					4
9.					•
111.					
12.					
14. 15.		_			
1 16.					
17. 18.					
20.		_			
21.					
23.					
24. 25.					
1 26.					
28.					
29. 30.					

FORM I VOA-TIC

1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW33	l
	l

- 1			~~~
Lab	Name:	MITKEM	CORP.

Contract:

Lab Code: MITKEM

Case No.:

LOW

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-13

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4430

Level:

(low/med)

Date Received: 04/07/98

% Moisture: not dec.

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Number TICs found: 1

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME			CONC	
1. U	======================================	15.04	=====	0.69	
2.		-5.51		0.03	
~ ·				·· · · · · · · · · · · · · · · · · · ·	
T.					
5.		_ .			
6		_ .			
7		_ .	 -		
9.		-		 :	
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.⊥.		- -			
.4.		- -			
.3.					
.4.					
.5.		_ .			
6.		_ .			
7.		_ .			
8		- -			
9.		_ -			
1.		- -			
4.		- -		· · · · · · · · · · · · · · · · · · ·	
J.		- -			
4.					
5					
6		_			
7		_ .			
8		- -			
9		_ .			
·		_ .			

FORM I VOA-TIC

1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW34

_			
T.ah	Name ·	MTTKEM	C

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-14

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4431

Level: (low/med)

Date Received: 04/07/98

% Moisture: not dec.

LOW

Date Analyzed: 04/08/98

GC Column: DB-624

Number TICs found: 1

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

Soil Extract Volume: ____(uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME		EST. CONC.	1
1.	UNKNOWN	15.05	 1.1	L JD
2				
J.				_
4	-			_ -
6				-
7		-		-
0.		-	·	-
9.				
				_
1.		.		_
∠.			· ·	_
3. 4.	_	_		-
5	_	_	,	-
6.				-
7.				
.8.		_ .	#*****	_
9.				_
0		_ -		_
1.	_	-		-
3		_ -		-
4.				
5.				_
6		_		_
7				
8. 9.				-
0.		— ·		-
U	_	_		-1

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

TW35	

EPA SAMPLE NO.

T - 1-	NT	N / T (T) / Z () N /	CODD
Lab	Name:	MITKEM	CORP.

Contract:

TW 35	

Lab Code: MITKEM

Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-15

Sample wt/vol:

25.00 (g/mL) ML

Lab File ID: V2B4432

Level:

(low/med)

% Moisture: not dec.

LOW

Date Received: 04/07/98

Date Analyzed: 04/08/98

GC Column: DB-624

ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

Number TICs found: 1

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.		
1.	UNKNOWN	15.06	2.4		K
2	-			.[0
3					
5					İ
6				.	
7.					
9.					
10.		 .		.	
12.					
1 13.					:
14			-	-	I
16.					1
17.					1
19				·[ı
20.					1
21.					ı
23.					ı
24.					
25. 26.				.	
1 27.					
∠8.					
29.				.	

FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

I.ah	Mame.	MTTKEM	COPP

Contract:

Lab Code: MITKEM Case No.:

SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Level: (low/med) LOW

Lab Sample ID: E0476-29

Lab File ID: V2B4455

Sample wt/vol: 25.00 (g/mL) ML

Date Received: 04/07/98

% Moisture: not dec. _____

Date Analyzed: 04/08/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1				
4.				
l "				
4				
0.				
7.				
9.				
10.				
11.				
12.				
14.				
l 15.				
16 17		·	·	
18.				
19.				
40.			-	
21.				
43.				
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25.				
26. 27.				
28.				
29. 30.				
30		· · · · · · · · · · · · · · · · · · ·		

FORM I VOA-TIC

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY	IDENTIFIED	COMPOUNDS	
			TW37
ITKEM CORP.	Co	ontract:	

Lab	Name:	MITKEM	CORP.	

Lab Code: MITKEM Case No.: SAS No.:

SDG No.: E0476

Matrix: (soil/water) WATER

Lab Sample ID: E0476-47

Sample wt/vol: 25.00 (g/mL) ML

Lab File ID:

V2B4576

Level: (low/med) LOW

Date Received: 04/07/98

% Moisture: not dec. ____

Date Analyzed: 04/11/98

GC Column: DB-624 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS: Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	COMPOUND NAME UNKNOWN		EST. CONC.	====#
			-455 -	

FORM I VOA-TIC



Appendix D Region II Work Sheet

US EPA Region II

Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

YES NO N/A

PACKAGE COMPLETENESS AND DELIVERABLES

		PACKAGE COMPDETENE	DESTRUCTION			
CASE	NUMBER	:	LABORATORY: Mitken Corp.			
SITE	NAME:	: 2500 Bmith Town, Long Island	SDG Number(s): E0476			
1.0	Chain c	f Custody and Sampling Tri	p Reports			
	1.1	Are the Traffic Reports/Ch present for all samples?	nain-of-Custody Records	11		
	ACTION	: If no, contact lab for or illegible copies.	replacement of missing			
	1.2	Is the Sampling Trip Report samples and all fractions:		ГŢ		
	ACTION	: If no, contact either RS contractor for this info				
2.0	Data Co	mpleteness and Deliverable	<u>es</u>			
	2.1	Have any missing deliveral added to the data package				
	NOTE:	The lab is required to substantiates, for each fractions ample and one dilution, concentrated dilution and dilution.)	on. (i.e., the original or, from the most			
	ACTIO	I: Call lab for an explana any missing deliverable provide them, note the package under the Contr section of the Data Ass Regional Data Assessmen	s. If lab cannot effect on review of the act Non- compliance essment and the Organic			
	2.2	Was CLASS CCS checklist i	ncluded with package?			<u>~</u>
	2.3	Are there any discrepanci Reports/Chain-of-Custody and Sample Tags?			Ц	
	ACTIO	N: If yes, contract the la explanation or resubmit deliverables.				

US EPA Region II

Method: CLP/SOW OLMO3.1

Date	: Oc	tob	er	19	95
SOP	HW-	6.	Rev		10

			165	NO	M/ M
3.0	Cover 1	Letter SDG Narrative			-
	3.1	Is the Narrative or Cover Letter Present?	Ų		
	3.2	Are Case Number and/or SAS number contained in the Narrative or Cover letter?	ų		
	3.3	Does the narrative contain the following information:			
		VOA: description of trap and columns used during sample analyses?	ų		
		BNA: description of columns used during sample analyses?			_/
		Pest: description of columns used during sample analyses?			_
	NOTE:	As per section 6.23.3.1 SOW/p. D-11/Pest, Packed columns are not permitted.			4
	3.4	Does the narrative, VOA and BNA sections, contain a list of all TICs identified as alkanes and their estimated concentrations?		_/	, s
	3.5	Does the narrative contain a record of all cooler temperatures? If the temperature of a cooler was exceeded, > 10° C, the lab must list by fraction and sample number, all affected samples.		<u>/</u>	и
	3.6	Does the narrative contain a list of the pH values determined for each water sample submitted for volatile analysis?		<u> </u>	4
	3.7	Does the Case Narrative contain the statement, "verbatim", as required in Section B of the SOW?	ГŢ		
	ACTIO	ON: If "No", to any question in this section, contact the laboratory for all necessary resubmittals. If information is not available, document in the Data Assessment under Problems/Non-Compliance section.			
	*)	information was found in other sections	-		4

US EPA Region II

Method: CLP/SOW OLMO3.1

Date: October 1995 SOP HW-6, Rev. 10

YES N/A NO 4.0 Data Validation Checklist Check the package for the following 4.1 discrepancies: a. Is the package paginated in ascending order starting from the SDG narrative? b. Are all forms and copies legible? c. Is each fraction assembled in the order set forth in the SOW? d. Is a Sample Data Summary Package submitted immediately preceding the Sample Data Package? The following checklist is divided into three parts. Part A is for any VOA analyses, Part B is for BNAs and Part C is Pesticide/PCBs. Does this package contain: VOA Data? BNA Data?

ACTION: Complete corresponding parts of checklist.

Pesticide/PCB data?

US EPA Region II Method: CLP/SOW OLMO3.1 Date: October 1995 SOP HW-6, Rev. 10

YES NO

PART A: VOA ANALYSES

1.0 Sample Conditions/Problems

Do the Traffic Reports/Chain-of-Custody Records, Sampling Report or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50% - 90% water, all data should be flagged as estimated "J". If a soil sample other than TCLP contains more than 90% water, all data should be qualified as unusable "R".

ACTION: If samples were not iced or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), then flag all positive results with a "J" and all non-detects "UJ".

ACTION: If both VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: The smallest soil size permitted is 0.5g. If any soil sample is smaller than 0.5g, document in the Data Assessment under Contract Problems/Non-Compliance.

2.0 Holding Times

2.1 Have any VOA technical holding times, determined from date of collection to date of analysis, been exceeded?

Technical Holding Times: If unpreserved, aqueous samples, maintained at 4° C for aromatic hydrocarbons analysis must be analyzed within 7 days of collection. If preserved with HCl (pH < 2) and stored at 4° C, then aqueous samples must be analyzed within 14 days of collection. If uncertain about preservation, contact sampler to determine whether or not samples were preserved. The holding time for soils is 10 days from date of collection.

US EPA Region II

Date: October 1995 Method: CLP/SOW OLMO3.1 SOP HW-6, Rev. 10

> N/A YES NO

Table of Holding Time Violations (See Chain-of-Custody Records)

Sample ID	Sample Matrix	Was Sample Preserved?	Date Sampled	Date Lab Received	Date Analyzed
					
					
	-				

ACTION: If technical holding times are exceeded, flag all positive results as estimated "J" and sample quantitation limits as estimated "UJ", and document in the Data Assessment that holding times were exceeded. If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re-analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results must be qualified "J", but the reviewer may determine that non-detect data are unusable "R". If holding times are exceeded by more than 28 days, all non detect data are unusable "R".

NOTE: Contractual Holding Times: Analysis of water and soil/sediment samples must be completed within 10 days of Validated Time of Sample Receipt (VTSR). This requirement does not apply to Performance Evaluation (PE) samples.

ACTION: If contractual holding times are exceeded, document in the Data Assessment and on the Organic Regional Data Assessment Summary form.

NOTE: The data reviewer must note in the Data Assessment whether or not technical and contractual holding times were met.

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YES NO 3.0 System Monitoring Compound (SMC) Recovery (Form II) Are the VOA SMC Recovery Summaries (Form II) 3.1 present for each of the following matrices: a. Low Water? b. Low Soil? c. Med Soil? Are all the VOA samples listed on the appropriate 3.2 System Monitoring Compound Recovery Summary for each of the following matrices: a. Low Water? b. Low Soil? c. Med Soil? ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document effect in the Data Assessments. Were outliers marked correctly with an asterisk? 3.3 ACTION: Circle all outliers in red. Was one or more VOA system monitoring compound 3.4 recovery outside of contract specifications for any sample or method blank? . If yes, were samples re-analyzed? Were method blanks re-analyzed?

ACTION: If recoveries are > 10%, but 1 or more compounds fail to meet SOW specifications:

- 1. All positive results are qualified as estimated "J".
- 2. Flag all non-detects as estimated detection limits "UJ" where recovery is less than the lower acceptance limit.
- 3. If SMC recoveries are above allowable levels, do not qualify non-detects.

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YES NO N/A

If any system monitoring compound recovery is
< 10%:</pre>

- 1. Flag all positive results as estimated "J".
- 2. Flag all non-detects as unusable "R".

Professional judgement should be used to qualify data that only have method blank SMC recoveries out of specification in both original and re-analyses. Check the internal standard areas.

NOTE: Contractual requirements state that if any SMC fails the acceptance criteria, the sample must be re-analyzed. If the affected sample was not re-analyzed, document in the Data Assessment under Contract Problems/Non-Compliance.

NOTE: The laboratory must submit the following data:
1. If SMC recoveries and internal standard responses meet the acceptance criteria in the reanalyzed sample, then the laboratory must submit only the re-analysis.

2. If an SMC recovery and/or internal standard response fails to meet the acceptance criteria upon re-analysis, then submit data from both analyses.

(Refer to section 11.4.3.2, page D-46/VOA of the SOW for more information.)

3.5 Are there any transcription/calculation errors between raw data and Form II?

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and note errors in the Data Assessment.

4.0 Matrix Spikes (Form III)

4.1 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form (Form III) present?

1/	

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			YES	МО	N,
	4.2	Were matrix spikes analyzed at the required frequency for each of the following matrices:			
•		a. Low Water?	1		
		b. Low Soil?			<u>/</u>
		c. Med Soil?			. —
	ACTION	N: If any matrix spike data are missing, take the action specified in 3.2 above.			
	4.3	How many VOA spike recoveries are outside QC limits?			
		<u>Vater</u> 2 x 60 Soils O out of 10 out of 10			
	4.4	How many RPDs for matrix spike and matrix spike duplicate recoveries are outside QC limits?			4
		Water Soils 0 out of 5 NA out of 5			
	ACTIO:	N: No action is taken based upon MS/MSD data <u>alone</u> . However, using informed professional judgement, the MS/MSD results may be used in conjunction with other QC criteria to determine the need for qualification of the data.			
	ACTIO	N: Circle all outliers in red.			
5.0	Blanks	(Form IV)	,		
	5.1	Is the Method Blank Summary (Form IV) present?	Lĺ		
	5.2	Frequency of Analysis: for the analysis of VOA TCL compounds, has a reagent/method blank been analyzed for each SDG or every 20 samples of similar matrix (low water, low soil or medium soil), whichever is more frequent?	ц		
	5.3	Has a VOA method blank been analyzed at least once every twelve hours for each concentration level and GC/MS system used?	17		

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VES NO N/A

	YES	NO	N/A
5.4 Was a VOA instrument blank analyzed after each sample/dilution which contained a target compound that exceeded the initial calibration range?	17	· .	
5.5 Was a VOA storage blank analyzed at the end of all samples for each SDG in a case?	ात्र		
ACTION: If any method/instrument blank data are missing, call lab for explanation or resubmittal. If method blank data are not available, reject "R" all associated positive data. However, using professional judgement, the data reviewer may substitute field blank or trip blank data for missing method blank data.			
If any instrument blank analyzed after a sample with high concentration is missing, contact the lab for resubmittals. If the instrument blank was not analyzed or not available, inspect the chromatogram of the sample analyzed immediately after this analysis for possible carryover. Use professional judgement to determine if any contamination occurred and qualify analyte(s) accordingly.			
If storage blank data is missing, contact the lab for the data. If unavailable, note in the Data Assessment under Contract Problems/Non-Compliance.			
The validator should verify that the correct identification scheme for the EPA Blank samples were used. See page B-33, section 3.3.7.3 of the SOW for further information.			
Was the correct identification scheme used for all VOA blanks?	口		
ACTION: Contact the lab for resubmittals or make the required corrections on the forms. Document in the Data Assessment under Contract Problems/Non-compliance if corrections were made by the validator.			
5.7 Chromatography: review the blank raw data- chromatograms (RICs), quant reports or data system printouts and spectra. Is the chromatographic performance (baseline stability)	,		
for each instrument acceptable for VOAs?	١٠٦		

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YES NO N

ACTION: Use professional judgement to determine the effect on the data.

5.8 Are all detected hits for target compounds in method and instrument blanks less than the CRQL for that analyte?

Exception: Acetone and 2-butanone must be less than 5 times the CRQL, and methylene chloride must be less than 2.5 times its CRQL.

ACTION: If yes, an explanation and laboratory's corrective actions must be addressed in the case narrative. If the narrative contains no explanation, then make note in the Data Assessment under Contract Problems/Non-Compliance.

6.0 Contamination

NOTE: "Water blanks", "drill blanks", and "distilled water blanks" are validated like any other sample, and are <u>not</u> used to qualify data. Do not confuse them with the other QC blanks discussed below.

6.1 Do any method/instrument/reagent/storage blanks have positive results (TCL and/or TIC) for VOAs?

NOTE: When applied as directed in the table below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for *moisture when necessary.

NOTE: A contaminated instrument blank is not allowable under this SOW. See page D-48/VOA, section 12.1.2.4 for additional information. Document in the Data Assessment under Contract Problems/Non-Compliance if contaminated instrument blank was submitted.

6.2 Do any field/trip/rinse blanks have positive VOA results (TCL and/or TIC)?

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

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YES NO N/A

NOTE: All field blank results associated with a particular group of samples (may exceed one per case) must be used to qualify data. Trip blanks are used to qualify only those samples with which they were shipped and are not required for non-aqueous matrices. Blanks may not be qualified because of contamination in another blank. Field Blanks & Trip Blanks must be qualified for system monitoring compound, instrument performance criteria, spectral or calibration QC problems.

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks. If any blanks are grossly contaminated, all associated data should be qualified as unusable "R".

For:	with a "U" when:	qualify "U" when:	is needed when:
Methylene Chloride Acetone Toluene 2-Butanone	Sample conc. is > CRQL, but < 10x blank value.	Sample conc. is < CRQL and < 10x blank value.	Sample conc. is > CRQL and > 10x blank value.
Other Conta- minants	Sample conc. is > CRQL, but < 5x blank value.	Sample conc. is < CRQL and < 5x blank value.	Sample conc. is > CRQL and > 5x blank value.

Flag sample result Report CRQL & No qualification

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

ACTION: For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R".

6.3 Are there field/rinse/equipment blanks as sociated with every sample?

ACTION: For low level samples, note in the Data
Assessment that there is no associated
field/rinse/equipment blank. For samples with

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YES NO N

high concentrations of suspected blank contaminants, use professional judgement to qualify these values and make a note in the Data Assessment.

Exception: samples taken from a drinking water
tap do not have associated field blanks.

7	٠.0	GC/MS	Instrument	Performance	Check	(Form	V)
,	. •	UU/ 880					

7.1	Are the GC/MS Instrument Performance Check Forms	
	(Form V) present for Bromofluorobenzene (BFB)?	-

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7.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift?

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7.3 Has an instrument performance check been analyzed for every analytical sequence on each instrument?

[전 - - -

ACTION: List date, time, instrument ID, and sample analysis for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS

ACTION: If lab cannot provide the missing data, reject "R" all data generated outside an acceptable twelve hour calibration interval.

7.4 Have the ion abundances been normalized to m/z 95?

ACTION: If mass assignment is in error, qualify all associated data as unusable "R".

7.5 Have the ion abundance criteria been met for each instrument used?

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ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

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		YES	NO	N/A
=	If ion abundance criteria are not met, the Region II TPO must be notified.			
be	re there any transcription/calculation errors tween mass lists and Form Vs? (Check at least to values, but if errors are found check more.)		[7]	
re nu	the number of significant figures for the ported relative abundances consistent with the mber given for each ion in the ion abundance riteria column?	口		
ex co	large errors exist, call lab for application/resubmittal, make necessary errections and document any effects in the Data seessments.			
	ce the spectra of the mass calibration compound cceptable?	ц		
ACTION:	Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			
8.0 Target Co	ompound List (TCL) Analytes			
pı	re the Organic Analysis Data Sheets (Form I VOA) resent with required header information on each age, for each of the following:			
. a.	. Samples and/or fractions as appropriate?			
b	. Matrix spikes and matrix spike duplicates?	17		
C.	. Blanks?	[X		
ma tl ir	re the VOA Reconstructed Ion Chromatograms, the ass spectra for the identified compounds, and ne data system printouts (Quant Reports) acluded in the sample package for each of the collowing:			
a	. Samples and/or fractions as appropriate?	M		
b	. Matrix spikes and matrix spike duplicates (mass spectra not required)?	M		
C	. Blanks?	[1]		

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		YES	МО	N/L
ACTIO	N: If any data are missing, take action specified			-
	in 3.2 above.			
8.3	Are the response factors shown in the Quant Report?	TA		
8.4	Is chromatographic performance acceptable with respect to:			
	a. Baseline stability?	17		
	b. Resolution?	[/]		
	c. Peak shape?	14		
	d. Full-scale graph (attenuation)?	14		
	e. Other:?			
ACTIO	N: Use professional judgement to determine the acceptability of the data.			•
8.5	Are the lab-generated standard mass spectra of the identified VOA compounds present for each sample?	17		_
ACTIO	N: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate its own standard spectra, document in the Data Assessment in the Contract Non-compliance section and the Organic Regional Data Assessment Summary.			
8.6	Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	14		
8.7	Are all ions present in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?		. <u></u>	
8.8	Do sample and standard relative ion intensities agree within $\pm 20\%$?		, 	_
ACTIO	ON: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected "R", flagged "N"			

(presumptive evidence of the presence of the compound) or changed to not detected "U" at the

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> N/A YES МО

calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 8.6, 8.7, and 8.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has

9.0 T

	affected any positive compound identification.			
entati	ively Identified Compounds (TIC)			
9.1	Are all Tentatively Identified Compound Forms (Form I Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?	<u>.</u>		
9.2	Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:			
	a. Samples and/or fractions as appropriate?	11		
	b. Blanks?	17		
	c. Alkanes listed for each sample?			<u>~</u>
ACTIO	N: If any TIC data are missing, take action specified in 3.2 above.		,	
ACTIO:	N: Add "N" qualifier to all chemically named TICs, if missing.			
9.3	Are any TCL compounds (from any fraction) listed as TIC compounds? (Example: 1,2- dimethylbenzene is xylene, a VOA TCL analyte, and should not be reported as a TIC.)		<u>1</u>	
ACTIO	N: Flag with "R" any TCL compound listed as a TIC.	٠		
9.4	Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?	17		
9.5	Do TIC and "best match" standard relative ion intensities agree within $\pm 20\%$?	lŢ	,	•

ACTION: Use professional judgement to determine the acceptability of TIC identifications. If it is determined an incorrect identification was

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YES

made, change the identification to "unknown," or to some less specific identification as appropriate. (Example: "C3 substituted benzene.")

Also, when a compound is not found in any blank, but is detected in a sample and is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable "R". (E.g., Common Lab Contaminants: CO_2 (M/E 44), siloxanes (M/E 73) hexane, aldol condensation products, solvent preservatives, and related by-products - see Functional Guidelines for more guidance.)

Are TICs with responses < 10% of the internal 9.6 standard (as determined by inspection of the peak areas or height) reported?

ACTION: If yes, cross out questionable TIC(s).

10.0 Compound Quantitation and Reported Detection Limits

Are there any transcription/calculation errors in 10.1 Form I results? (Check at least two positive values. Verify that the correct internal standards, quantitation ions, and RRF were used to calculate Form I results.)

10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?

ACTION: If errors are large, call the lab for explanation/resubmittals, make any necessary corrections, and note errors under Contract Problems/Non-Compliance section of the Data Assessment and the Organic Regional Data Assessment Summary.

ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its associated value on the original Form I and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form Is

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> NO N/A YES

that should not be used, including any in the summary package.

11.0 Standards Data (GC/MS)

Are the Reconstructed Ion Chromatograms, and data system printouts (Quant. Reports) present for initial and continuing calibration?

[4

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

12.0 GC/MS Initial Calibration (Form VI)

12.1 Are the Initial Calibration Forms (Form VI) present and complete at concentrations of 10, 20, 50, 100, 200ng for separate calibrations of low water/med soils (unheated purge) and low soils (heated purge)?

ACTION: If any calibration standard forms are missing, take action specified in 3.2 above.

Were all low level soil standards, blanks and samples analyzed by heated purge?

[]

ACTION: If low level soil samples were not heated during purge, qualify positive hits "J" (estimated) and non-detects "R".

Are the % relative standard deviation (%RSD) 12.3 values for VOAs ≤ 30% over the concentration range of the calibration?

ACTION: Circle all outliers in red.

NOTE: Although 11 VOA compounds have a minimum RRF and no maximum %RSD, the technical criteria are the same for all analytes.

ACTION: If %RSD is > 30.0%, qualify associated positive results for that analyte "J" and non-detects using professional judgement. When %RSD is > 90%, flag all non-detects for that analyte "R" (unusable) and positive hits "J" (estimated).

NOTE: Analytes previously qualified "U" for blank contamination are still considered as "hits" when qualifying for initial calibration criteria.

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etrod: CT5/20M OTW	103 ° T	501	1111-0	, Kev	• = 4
· ·			YES	МО	N/
12.4 Are any	average RRFs < 0.05?			П	
Action: Circle	e all outliers in red.				
associ	e average RRF is < 0.05, then qua ated non-detects with an "R" and ated positive data as estimated	l flag			
the repo	re any transcription/calculation orting of average relative respon (RRF) or %RSD? (Check at least errors are found, check more.)	ıse		17	<u></u>
to fail %RSD is 5, page	allows up to two of the <u>required</u> %RSD or RRF criteria, provided ≤ 40% and the RRF is ≥ 0.010. (SD-59/VOA or analytes marked with for required analytes.)	that the See Table			
criter Contra	re than two analytes failed %RSD ria, document in the Data Assessm act Problems/Non-Compliance and t ic Regional Data Assessment Summa	ment under the			(
3.0 GC/MS Continu:	ing Calibration (Form VII)	,			
present	Continuing Calibration Forms (Forms and complete for separate calibrer/med soil and low soil samples?	ration of	Ц	<i></i>	
analyzed	ontinuing calibration standard bed for every twelve hours of samples per instrument?	een le	ц		******
calib twelve for e calib	y forms are missing or no continuous ration standard has been analyzed be hours of every sample analysis, xplanation or resubmittal. If contains are not available, finated sample data as unusable "Rusable "Rusable"	d within , call lab ontinuing lag all			
withi	below all sample(s) that were not not twelve hours of the previous coration.	t analyzed ontinuing			

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N/A YES NO

13.3	Do any volatile compounds have a percent
•	difference (%D) between the initial and
	continuing RRF which exceeds the ±25% criteria?

ACTION: Circle all outliers in red.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated. When %D is > 90%, qualify all non-detects for that analyte "R" (unusable) and positive results "J" (estimated).

Are any continuing calibration RRFs < 0.05?

ACTION: Circle all outliers in red.

ACTION: If the RRF is < 0.05, qualify the associated non-detects as unusable "R" and the associated positive values "J".

NOTE: The SOW allows up to two of the required analytes to fail %D and RRF criteria, provided that the %D is \leq 40% and the RRF is \geq 0.010. (See Table 5 pg. D-59/VOA or analytes marked with a "*" on Form VI for required analytes.)

ACTION: If more than two analytes failed %D and RRF, criteria document in the Data Assessment under contract Problems/Non-Compliance and on the Organic Regional Data Assessment Summary form.

13.5 Are there any transcription/calculation errors in the reporting of RRF or %D between initial and continuing RRFs? (Check at least two values, but if errors are found, check more.)

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document in the Data Assessment under the Contract Problems/Non-Compliance section and the Organic Regional Data Assessment Summary.

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YES NO

) N/

14.0	Internal	Standard	(Form	VIII)
	7			•

14.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to +100%) for each continuing calibration?

If no, was the sample re-analyzed?

ACTION: 1. Circle all outliers in red.

2. List all the outliers below.

Sample #	Internal Std.	Area	Lower/Upper Limit
	·		74 - 15 Tab
,		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 D. L. C. L. C. S. L. C
			\$ \$ 15.72
		· · · · · · · · · · · · · · · · · · ·	

(Attach additional sheets if necessary.)
(or attach copies of Form VIIIs)

ACTION: If any sample was not re-analyzed, document in the Data Assessment under Contract Problems/Non-Compliance.

ACTION: 1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

- Non-detects associated with IS area counts > 100% should not be qualified.
- 3. If the IS area in the sample is below the "lower limit," < 50%, qualify all analytes associated with that IS estimated, "J". If the area counts are extremely low, < 25% of the area in the 12 hour standard, or if performance exhibits a major abrupt drop- off, flag all associated non-detects as unusable, "R", and positive hits estimated, "J".
- 14.2 Are the retention times of the internal standards within 30 seconds of the associated calibration standard?

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N/A NO YES

ACTION: Professional judgement should be used to

qualify data if the retention times differ by

more than 30 seconds.

NOTE: Contractual requirements state that if any come the internal standard fails the acceptance criteria, the sample must be re-analyzed. If the affected that sample was not re-analyzed, document in the Data

Assessment under Contract Problems/Non-

Compliance.

NOTE: See Notes in section 3,4, page 7 for a

description of sample data the laboratory must grading #

submit.

15.0 Field Duplicates

Were any field duplicates submitted for VOA

analysis?

ACTION: Compare the reported results for field

duplicates and calculate the relative percent

difference.

ACTION: Any gross variation between duplicate results

must be addressed in the reviewer narrative.

However, if large differences exist,

identification of field duplicates should be

confirmed by contacting the sampler.

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SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM EPA CONTRACT 68 WS-0019

END OF DATA PACKAGE

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